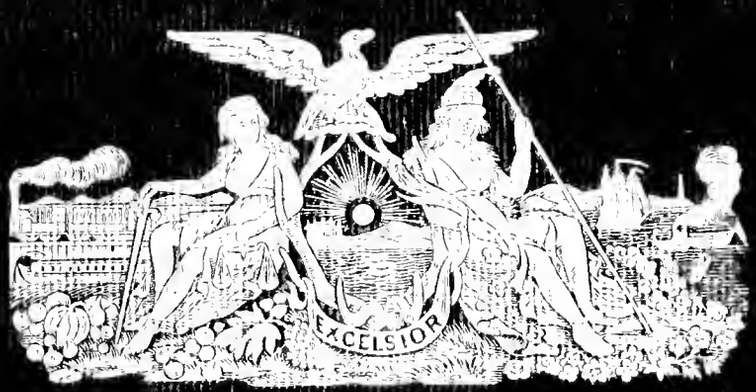
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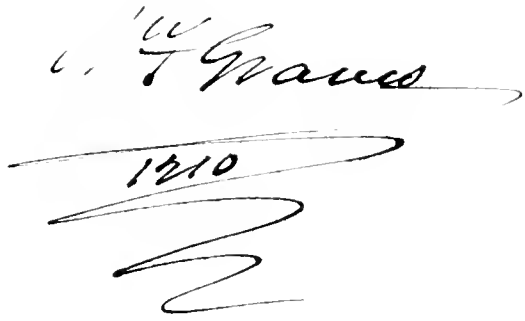
C. W. Graves
1910

ORDER OF THE WORK.

GENERAL INTRODUCTION.

PART I.

ZOOLOGY;

BY JAMES E. DE KAY.

PART II.

BOTANY;

BY JOHN TORREY.

PART III.

MINERALOGY;

BY LEWIS C. BECK.

PARTS IV. & V.

GEOLOGY AND PALÆONTOLOGY;

BY WILLIAM W. MATHER, EBENEZER EMMONS, LARDNER VANUXEM AND JAMES HALL.

ZOOLOGY

OF

NEW-YORK,

OR THE

NEW-YORK FAUNA;

COMPRISING DETAILED DESCRIPTIONS OF ALL THE ANIMALS HITHERTO OBSERVED WITHIN THE STATE OF NEW-YORK, WITH BRIEF NOTICES OF THOSE OCCASIONALLY FOUND NEAR ITS BORDERS, AND ACCOMPANIED BY APPROPRIATE ILLUSTRATIONS.

BY JAMES E. DE KAY.

PART I. MAMMALIA.

ALBANY:
PRINTED BY W. & A. WHITE & J. VISSCHER.

1842.

To WILLIAM H. SEWARD,

Governor of the State of New-York.

SIR,

I submit a Report on the Zoology of the State;

And have the honor to be,

With great respect,

Your obedient servant,

JAMES E. DE KAY.

THE LOCUSTS, QUEENS Co., L. I.
January 1, 1842.

PREFACE.

The examination of the Quadrupeds, (or as they are with more exactness, although perhaps with less elegance named, the Mammalia or Mammiferous animals) of the United States, has, until recently, attracted comparatively little attention among our own citizens. A few isolated species had been casually noticed, a few detached facts recorded; and here and there, over this widely extended country, a few zealous observers, aware of the general apathy at home, had transmitted their observations to distinguished foreign naturalists. Such instances were, however, of comparatively rare occurrence. The chief historians of our animals have been foreigners, either accidentally led to our shores by motives entirely unconnected with scientific pursuits, or naturalists sent out under the patronage of their respective governments, to collect and describe our animals. In the first class may be mentioned De Liancourt, De Chastellux and others; in the second, Bosc, Kalm, Michaux and Pal. de Beauvois. To these, and to other European naturalists who have described through the imperfect and often distorted medium of preserved specimens, we are indebted for the greater part of the knowledge which we possess respecting many of our own animals.

Of late years, the attention of our countrymen has been more directed to the study of Zoology. The establishment of the Academy of Natural Sciences at Philadelphia, forms an epoch in this department of knowledge. This was soon succeeded by the formation of the Lyceum of Natural History of New-York, and by others in Boston, Baltimore, New-Haven and Salem. The American Journal of Science, which, under the efficient guidance of Professor Silliman, has now reached its forty-third volume, is a rich mine to the American naturalist, and has contributed to promote and extend a taste for such inquiries.

At the commencement of the Survey, the services of an eminent naturalist, Mr. Abraham Halsey, of New-York, were engaged for the department of zoology; but before he had entered upon its duties, other engagements and occupations demanded his attention, and he resigned his office. We may be permitted to express our regret that circumstances should have prevented him from undertaking a task, which could not have been committed to an abler hand.

In the execution of this part of the work, I have to acknowledge my obligations to Maj. Le Conte, for the valuable hints he has suggested, and the opportunities which he has afforded of examining his drawings, manuscripts and specimens. To Dr. Emmons, of the geological department of the Survey, I am obliged for his numerous specimens and communications. His many sterling qualities can scarcely be appreciated, except by those who, like myself, have been the companion of his journies through the uninhabited and as yet unknown forests of the northern district. To Prof. Hall, also of the Survey, I am indebted for several specimens, and for valuable communications on the zoology of the State. Mr. J. G. Bell and Mr. W. Cooper of New-York, Dr. Harlan of Philadelphia, and the Rev. Mr. Linsley of Elmwood Place, Connecticut, have also in various ways facilitated my inquiries. I must also record my obligations to the Lyceum of Natural History of New-York, for the opportunities which their valuable collection has afforded me of comparison and description.

Having thus briefly adverted to the sources of information, in connection more especially with the Mammalia of the State, it may be deemed proper to give a concise sketch of the region whose animals we have undertaken to describe.

New-York, one of the twenty-six States of the North American Confederacy, lies wholly within the temperate zone. Its figure may be compared to that of an irregular triangle, with its apex touching the Atlantic, and one of its sides bounded by two of the great inland seas, and by their outlet to the Gulf of St. Lawrence. Its connection with the Atlantic is extended easterly one hundred and forty miles, by a low sandy spur called Long Island. Including this easterly prolongation, the State of New-York may be said to extend through eight degrees of longitude, and to be included between 40° 30′ and 45° of north latitude. It contains more than 46,000 square miles, a surface larger in extent than that contained in Poland or Scotland, or Naples and Sicily; three times larger than the Swiss Confederacy, and nearly equal in extent to that of England. Although situated within the same parallels of latitude which include the greater part of

Italy, the south of France, and the northern parts of Spain; yet from the well established fact of the more southerly position of the isothermal lines on the western shores of the Atlantic, its mean annual temperature cannot be compared with that of the above mentioned countries, but rather with those lying from fifteen to twenty degrees farther north. The result of ten years' observations at New-York, gives one hundred and sixty-five days, or about five months, as the mean duration of winter; but in the interior or northern district, many of the counties have scarcely a month without frost. This, it will readily be perceived, must exercise a great influence upon the number and distribution of its animals; for while it has the summer heats of Spain and Italy, the rigor of its winters equals those of the northern portions of Europe. From this diversity of climate, it results that we have in the State similar classes of animals with those found in the northern parts of Europe, and at the same time other families existing chiefly in its southern portions. The families *Cervidæ* and *Mustelidæ* may serve as examples of the one, while the *Vespertilionidæ* and *Muridæ* will illustrate the other.

Varieties of surface are also well known to be favorable to the multiplication of animal species, and in this respect, the State of New-York offers a great diversity; for although few of its mountains exceed the height of five thousand feet, yet from the peculiarity of climate alluded to above, their summits have a temperature much lower than mountains of even higher altitude in corresponding parallels in Europe. The surface of New-York is considerably elevated, much of it lying on the great Allegany table land. The diversity of surface is, however, so great, that for the purposes of more intelligible description, we may consider it as divided into four principal zoological districts, each sufficiently distinct in itself, but of course so much blended at the lines of separation as not to be contradistinguished.

1. *The Western District,* includes that portion of the State which is bounded on the west and north by Lakes Erie and Ontario, and on the south by the boundary line separating it from the State of Pennsylvania; and it extends eastwardly until it is lost in the valley of the Mohawk on the north, and the mountainous parts of the Hudson district. A large portion of this district is an elevated region, furrowed by valleys running in a north and south direction, supposed once to have been the outlets of a great inland ocean, but now the beds of rivers which, pursuing opposite courses, discharge themselves on the one hand through

Lake Ontario into the Gulf of St. Lawrence, and on the other into the Delaware and Chesapeake bays, and into the Gulf of Mexico. The central portion of this district is a level table land, rising in its southern parts into elevations of from a thousand to twelve hundred feet above tide, and abruptly subsiding on its western borders to the level of the great lakes. In the western part, we have the Cattaraugus and Tonawanda streams pouring into Lake Erie and Niagara river; the sources of the Allegany river; one of the branches of the Ohio, itself a tributary to the Mississippi; and another branch of the Allegany takes its rise from Chautauque lake, a sheet of water sixteen miles in length, 1291 feet above tide, and 726 above Lake Erie. Eastward of these is the Genesee river, which, taking its rise in Pennsylvania, crosses the whole district in a north direction, and empties into Lake Ontario. As we proceed eastwardly, we cross successively, in the southern portions of this district, the Canisteo, Conhocton, Chenango, and great western branch or principal source of the Susquehannah, which takes its rise in the Otsego lake, a sheet of water nine miles long, with a breadth varying from three quarters of a mile to three miles. The central portions of this district are occupied by a series of ten to twelve lakes, stretching generally to north and south, varying from fifteen to thirty-eight miles in length; all discharging themselves by one common outlet, the Oswego river, into Lake Ontario. On its extremely eastern border rises the Mohawk, a tributary of the Hudson, which connects it zoologically with the Hudson river district. The great inland seas of Erie and Ontario, the one two hundred and seventy miles in length, with a breadth from twenty to fifty miles; and the other one hundred and ninety miles, with an average breadth of forty miles, exercise a great influence on its climate and consequent zoological character. The surface of Lake Erie, which is three hundred and thirty-four feet above Lake Ontario, discharges its waters through the rapids and falls of Niagara river, into that lake, within a distance of thirty-six miles. This entire district is exceedingly fertile, and is covered by a vigorous growth of forest trees in the uncultivated portions. Without entering into details which would find a more appropriate place in a topographical survey, it will be perceived, that while on the one hand the vicinity of such large masses of water must ameliorate its climate, its fertile soil irrigated by so many streams will furnish the means of subsistence to numerous species of animals. It is zoologically connected by its valleys and water courses with the great basin of the St. Lawrence, and we accordingly find in this district animals common to both, although

not to so great an extent as in the region next to be described. Among the Mammalia, we find the Northern Lynx, the Deer Mouse and Porcupine; while all the lakes in the interior of this district, which empty into the Lake Ontario, formerly abounded with Salmon, which found their way from the sea through the Gulf and River St. Lawrence. In its southern portions it is similarly connected with the basin of the Mississippi, and the intermediate regions are watered by the streams which empty into the Delaware and Chesapeake.

2. *The Northern District* comprises, as its name imports, the northern portion of the State, which forms an irregular truncated triangle, bounded on its western side by Lake Ontario and the River St. Lawrence, on its eastern side by Lake Champlain and Lake George, and lying north of the Mohawk valley. This district, in its southern and southeastern portions, rises into numerous conical peaks and short ranges, attaining in some places an elevation of more than five thousand feet. Towards Lakes Champlain and George, these subside suddenly to the level of those sheets of water. To the north and northwest, this descends by a gradual and almost imperceptible slope towards the River St. Lawrence. This slope is watered by the Oswegatchie, the Moose and Black rivers, the Raquet and Grass and St. Regis rivers, all arising from numerous lakes embosomed in the mountainous regions of its southern parts. Lake Champlain, a part of its eastern boundary, extends north and south one hundred and forty miles, is twelve miles wide in its broadest part, and discharges its water through the Sorel river into the St. Lawrence. Into the southern part of this lake is also poured the waters of Lake George or Horicon, thirty-seven miles long, and varying from one to seven miles in breadth. The cluster of mountains in its southeastern portions may be considered as an offset from the great Appalachian system, which, descending through the States of Maine, New-Hampshire and Vermont, passes southwesterly between the Western and Hudson river districts, and is continued under the name of the Allegany range of mountains. In this region too we find the Sacondaga, Cedar, Jessup, and other tributaries of the Hudson, within a short distance of those which pour into the St. Lawrence. This mountainous region comprises the counties of Essex, Hamilton, Herkimer and Warren, and the southern part of the counties of Clinton, Franklin and St. Lawrence, and has been estimated to contain an area of about six thousand square miles. Its zoological character is strongly impressed by the features just alluded to. The chief growth of trees in this district are the Spruce, Pine, Larch, Balsam, Fir and

Cedar. We find in this district many of the fur-bearing animals, such as the Sable, the Fisher, and the Beaver. Here too roam the Moose, the Wolverine, and others now only found in high northern latitudes. It also forms the southern limits of the migration of many arctic birds; and we accordingly meet here with the Canada Jay and Spruce Grouse, the Swan, the Raven and the Arctic Woodpecker.

3. *The Hudson Valley District*, includes those counties watered by the River Hudson and its tributaries. Its chief tributary, the Mohawk, after a course of about one hundred and forty miles, enters the Hudson from the west, at the distance of one hundred and sixty miles from its entrance into the ocean. The shape of this district is of course modified by the length and direction of the Mohawk river, and bears some resemblance to the letter ⅂ inverted. Smaller than either of the two preceding, it is nevertheless of much zoological interest. At its upper portion, it is connected with the Northern district, and contains many animals in common with the States bordering on the eastern margin. Along its western border, it becomes elevated into high ranges of mountains, called the Kaaterskills, some of which attain an elevation of nearly four thousand feet, containing deer, wolves, panthers and bears. By the valley of the Mohawk, it is zoologically connected with the Western district; and this connection is becoming daily more obvious, by the great artificial water channels which reflect so much honor on the zeal and enterprise of her citizens. Thus the Soft-shelled Turtle and Rock Bass of Lake Erie is now found in the Hudson; in the same way that the Yellow Perch, the Muskallonge, and others peculiar to the great lakes, have, by means of the Ohio canal, found their way into the Mississippi through the Ohio. On the south it is connected with the Atlantic, and accordingly we find it teeming with the inhabitants of the ocean. On the other hand, the Hudson river appears to form a natural geographic limit to the extension of some species, at least in any considerable numbers. Thus, the Opossum of the South rarely, if ever, outsteps this boundary; among reptiles, the Chain Snake and Brown Swift, and the Buzzard and many other species among the birds. From the north also this river appears to be a barrier to their progress south; but these will be more fully detailed in the course of the following pages.

4. *The Atlantic District* comprises Long Island, with a medium breadth of ten miles, extending in a northeasterly direction one hundred and fifty miles. Its insular position influences its climate, and we accordingly find a great difference

between its temperature and that of the main land. It is a low sandy region, with extensive plains, and rising along its northern borders into hills of moderate elevation, at but one point only exceeding three hundred feet in height. Although much smaller than any of the preceding districts, yet it possesses some zoological features of interest. Its insular position, and its early settlement, has occasioned the extirpation of the larger quadrupeds, such as the Otter, Wolf and Bear; but deer are still numerous. It is more remarkable for the abundance and variety of its birds, than for the number of its mammalia. Here we find the extreme southern limits of the migrations of the arctic species, and the northernmost termination of the wanderings of the birds of the torrid zone. Thus we find in winter in this district, the Eider Duck, the Little White Goose, the Great Cormorant, the Auk, and many others from the Arctic ocean. During the heats of summer, we meet with the Turkey Buzzard and Swallow-tailed Kite, the Fork-tailed Flycatcher from the tropical wilds of Guiana, and numerous others from the south. It seems also to be the boundary between the fishes and other classes of the northern and tropical seas, and occasionally furnishes specimens from either extremity.

In conclusion, we have to make a few observations respecting the illustrations which accompany this work. These were all executed by Mr. J. W. Hill, and with the exceptions which are noted in their proper places, were taken from the animal itself, either alive, or from specimens carefully mounted by persons who had been conversant with their habits during life. In some classes, where the colors were fleeting, several individuals were successively employed, in order to secure with more certainty their evanescent hues. The outlines in all cases were taken with the camera lucida, which we conceive to be the best and most expeditious mode hitherto devised. It will be observed that the figures are not on a uniform scale, and that a small animal is often represented apparently larger than one of greater bulk. This could not be remedied, except by drawing them all on a scale which would have involved an expense of time and means utterly useless, and inadequate to the purposes of the Survey. This apparent defect is remedied by a notice on the plate, of the scale upon which the species is drawn; and the measurements throughout the work are uniformly given in feet, inches, tenths and hundredths, which correspond with those employed by the English.

It was originally proposed to employ the most eminent engravers upon the illustrations, in order to render the work more worthy of the State under whose auspices it was undertaken, and at the same time to furnish specimens of the

state of this particular branch of the fine arts at the period of publication. This was, however, soon found to involve an enormous expense, and to be accompanied with a delay utterly incompatible with the early publication of the work. Most of the Mammalia, and a few of the Birds and Fishes, are thus executed; but we hope that in the lithographies furnished by Mr. G. Endicott, the naturalist will not regret a departure from the original plan.

In one instance I have introduced the figure of a species not known with certainty to exist in the United States, and for which an explanation may appear necessary. I allude to the Manati, or Sea Cow of South America. The exceedingly rare opportunity which I had of examining this animal in a living state, of having a faithful drawing made, and of being subsequently enabled to enter into some of the osteological details, was too valuable to be allowed to escape. It was thought that it would be interesting to the American naturalist, to be thus enabled to compare it with the Florida Manati, from which it has been strongly suspected to be specifically distinct. I was, moreover, desirous of giving an accurate illustration of one of the herbivorous cetacea, a group the least known of all the class Mammalia.

I may possibly have attached more importance to the various popular names given in different districts, than will perhaps be acknowledged by the technical naturalist. It has been objected to their use, that they are often unmeaning or absurd, and often doubtful in their application. The careful collator of synonimes will, however, doubtless have discovered that the same charge may often be applied to names drawn up with technical nicety, and in conformity with the laws of nomenclature. As this work is intended for general readers, I have introduced popular names whenever they could be obtained. The greater part of our knowledge of the habits of animals is derived from persons unskilled in natural history; and the fact that the same popular name is variously employed in different districts, will often enable us to avoid error. A familiar example of this is afforded by the history of the Wolverine. Under this name three different animals, the Northern Lynx, the Wolverine proper and the Bay Lynx have been described, and their habits strangely confounded by writers who were not aware that the same popular name had been applied in different districts to them all.

In consulting authorities, we have taken pains to cite all the American writers within our reach. The student is frequently at a loss where to find descriptions of such animals as may come under his notice; and these are distributed through

so many journals, magazines and other periodicals entirely unconnected with natural history, that we hope their citation will be favorable received. In settling the weight due to contradictory statements, we have endeavored to avoid the influence which is supposed to be connected with the *verba magistri;* and in all cases have freely, and we trust not offensively, expressed our opinions when our own observations have been at variance with those of previous writers.

JAMES E. DE KAY.

The Locusts, Queens County.
January 1, 1842.

TABULAR VIEW

OF THE

GENERA OF MAMMALIA OBSERVED IN THE STATE OF NEW-YORK.

Orders.	Families.	Genera.
Marsupiata,	Didelphidæ,	Didelphis.
Carnivora,	Vespertilionidæ,	Vespertilio.
	Soricidæ,	Condylura.
		Scalops.
		Sorex.
		Otisorex.
	Ursidæ,	Ursus.
		Procyon.
		Gulo.
	Mustelidæ,	Mephitis.
		Mustela.
		Putorius.
	Lutridæ,	Lutra.
	Canidæ,	Canis.
		Lupus.
		Vulpus.
	Felidæ,	Felis.
		Lyncus.
	Phocidæ,	Phoca.
		Stemmatopus.
Rodentia,	Sciuridæ,	Sciurus.
		Pteromys.
	Arctomidæ,	Arctomys.
	Gerbillidæ,	Meriones.
	Castoridæ,	Castor.
		Fiber.
	Hystricidæ,	Hystrix.
	Muridæ,	Mus.
		Arvicola.
	Leporidæ,	Lepus.
Ungulata,	Elephantidæ,	Elephas.
		Mastodon.
	Suidæ,	Sus.
	Equidæ,	Equus.
	Bovidæ,	Bos.
	Capridæ,	Ovis.
	Cervidæ,	Cervus.
		Elaphus.
		Rangifer.
Cetacea,	Balænidæ,	Balæna.
		Physeter.
		Rorqualus.
	Delphinidæ,	Globicephalus.
		Phocæna.
		Delphinus.

THE NEW-YORK FAUNA.

CLASS I. MAMMALIA.

VIVIPAROUS, OR BRINGING FORTH THEIR YOUNG ALIVE. SUCKLE THEIR YOUNG BY MAMMÆ OR TEATS, AND HENCE THE NAME. FURNISHED WITH WARM RED BLOOD. HEART WITH TWO AURICLES AND TWO VENTRICLES; BREATHING BY LUNGS. BODY USUALLY COVERED WITH HAIR, AND FURNISHED IN MOST CASES WITH FOUR FEET.

The characters assigned to this class are sufficiently distinctive; and yet, with the single exception of suckling their young, none are absolute or invariable. Thus in the *Manis* and *Armadillo* of South America, the body is covered with scales; in the *Manatus* of Florida, there are but two feet; and these in the *Whales*, *Porpoises*, &c. are reduced to the shape and functions of fins. In the totality of the characters, however, we obtain a correct idea of the class under consideration.

According to the generally received arrangement of the animals of this class, it is divided into seven orders.* The characters of two of these are derived from the number or structural functions of their extremities; of three, from the form, disposition or entire absence of their teeth; of the sixth, from the nature of the coverings of their feet; and of the seventh, from the form of their body, and the element in which they live, and the peculiar shape and arrangement of their extremities.

* From the time of Aristotle to the present day, *Man* has invariably been placed at the head of this class. There are not wanting, however, many eminent naturalists, who are unwilling to see Man standing as a representative of a Genus, or even of of an Order among his kindred brutes; who are not disposed to admit that Man, created in the image of God, has any affinity with the beasts that perish; or that, because he possesses certain zoological characters which are entirely secondary and subordinate, he should be classed with brutes, when his noblest attribute, reason, destroys every vestige of affinity, and places him immeasurably above them all.

In any natural arrangement, the most appropriate distinction of each order would seem to be that which is derived from the same set of organs. This has, however, been attempted in vain; and we are accordingly left at liberty to select from the various systems that which may seem best adapted to the great end proposed by all naturalists, the knowledge of species, and their relations to each other.

The animals arranged under the Order QUADRUMANA, comprising Lemurs, Monkeys, &c. are rarely found on this continent beyond the tropical regions, and of course are not known within our territorial limits. Lichtenstein asserts that none have been seen beyond the twenty-ninth degree of north latitude.

ORDER II. MARSUPIATA.

Carnivorous and herbivorous. Thumb of the hind feet opposable to the toes, the nail small or wanting. Many of the females with abdominal pouches opening externally, and supported by peculiar bones attached to the pubis. Teeth various, but usually numerous. Tail long, naked or hairy, generally prehensile.

OBS. The natural position of the animals belonging to this order, has long exercised the ingenuity of naturalists. Their internal organization is so varied and peculiar, that as CUVIER observes, they may be looked upon as a class containing several orders running parallel with the orders of the ordinary quadrupeds. Some species, by their teeth, naturally belong to the Order *Carnivora;* whilst others can only be arranged (in a system derived from the teeth alone) with the Order *Rodentia;* and this has in fact been attempted by some naturalists.

We have ventured to place this order here, as it seems to form, by the structure of its feet and tail, a natural passage from the Quadrumana.

FAMILY DIDELPHIDÆ.

Three kinds of teeth, forming nearly a continuous series. Tail long, naked or hairy, usually prehensile. Female with a loose fold of skin on the abdomen, forming a sac or pouch for the reception of her young.

OBS. The animals of this family are found in America, Australia and the Indian Archipelago. The sac or pouch is supported by two bones attached to the pubis; and it is worthy of note, that the male, who has no pouch, nevertheless possesses these marsupial bones. It is stated by geologists, that the earliest mammiferous animals whose remains are found in the ancient strata belong to this order. None have been found, we believe, in North America,

and they are of very rare occurrence in any part of the world.* There are about fifty living species, distributed among ten or twelve genera, which have been described by different naturalists; but one only is found in the United States.

GENUS DIDELPHIS. *Linneus.*

Muzzle pointed; ears large and membranous. Internal toe of the hind foot opposable, without a nail. Tail half hairy and scaly. Teats varying in number, and placed within the pouch. Teeth, 48–50: *Incisors,* $\frac{10}{8}$; *Caniñes,* $\frac{2}{2}$; *Cheek teeth,* $\frac{12-14}{14}$.

THE AMERICAN OPOSSUM.

DIDELPHIS VIRGINIANA.

PLATE XV. FIG. 2

Virginian Opossum. PENNANT, Arct. Zool. Vol. 1, p. 73; Hist. Quad. Vol. 2, p. 13, pl. 63.
Le Sarigue à oreilles bicolores. CUVIER, Règne Animal, Vol. 1, p. 172. Ed. prima.
Didelphis virginiona. HARLAN, Fauna, p. 119. GODMAN, Am. Nat. Hist. Vol. 2, p. 7 (figure).
Virginian Opossum. Griffith's Cuv. Vol. 3, p. 24 (figure).

Characteristics. Greyish white. Fur woolly, intermixed with long white hair. Ears black; base and margin flesh color. Length two feet.

Description. Head long and pointed, with the facial outline nearly straight; long black bristles on the sides of the nose, over each eye and on the sides of the cheeks. Eyes oblique, and placed near the facial outline. Nostrils separated by a groove. Ears thin, membranous. Gape of the mouth wide, and exhibiting most of the teeth. Nails rather short, and curved on all the toes, except on the thumb or inner toe of the posterior extremities. In the figure given by Godman, this is represented as clawed, but his generic character asserts the contrary. Soles of the hind feet furnished with large fleshy tubercles. Mammæ or teats are, according to Desmarest, thirteen in number, and disposed in a circle around a central one; according to Godman, there are eight on each side, which we suppose to be the normal number. Tail enlarged at the base, where it is hairy for about four inches; the remaining part scaly, and covered with a few inconspicuous short rigid hairs. Fur of two kinds; a short woolly hair beneath, intermixed with longer and more rigid hairs, but all are very soft. Incisors ten above, the two anterior rather cylindrical, longest; an interspace between the incisors and the canine, which is compressed and pointed; the first jaw tooth smallest, the four first compressed, the three last transversely broader. In the lower jaw, the eight incisors rounded and directed forwards, with no interspace between them and the canine. The cheek teeth with regular points, and not transversely dilated.

Color. Greyish white, darker along the sides; on the face and abdomen, lighter grey. This color is produced by the intermixture of the short wool, which is white at the base and

* BRODERIP, Zool. Journ. Vol. 3, page 408.

black at the tips, with the long white hairs. On the back, and on the legs, this color becomes of a deeper hue, with various shades of intensity, sometimes even approaching to black. Ears black at base, the borders white.

Length of head and body, 15·0 – 20·0.
Length of tail, ... 10·0 – 12·0.
Weight, ... 10 – 14 lbs.

The Opossum is a nocturnal animal, moving with great agility among the branches of trees, and using his tail as a means of support, in the same way that it is employed by the members of the Family *Cebidæ*, or Monkeys of South America. On the ground his movements are clumsy and slow, and he appears to depend more upon cunning than upon strength or activity for the means of escape. When surprised on the ground, he compresses himself into the smallest possible space, and remains perfectly quiet. If discovered, and even handled in this state, it still counterfeits death, and takes the first opportunity to effect its escape. From this and other traits of cunning, has arisen the local phrase of "playing possum," to designate any adroit cheat.

The singular and anomalous organization of this animal, and its consequent peculiarities of reproduction, have long excited much attention among scientific inquirers. The young are found in the external abdominal sac, firmly attached to a teat in the form of a small gelatinous body, not weighing more than a grain. It was for a long time believed that there existed a direct passage from the uterus to the teat, but this has been disproved by dissection. Another opinion is, that the embryo is excluded from the uterus in the usual manner, and placed by the mother to the teat; and a third, that the embryo is formed where it is first found. Whether this transfer actually takes place, and, if so, the physiological considerations connected with it, still remain involved in great obscurity.

I do not find with whom the Latin specific name originated. It is usually attributed to Pennant, who, in his History of Quadrupeds, calls it the *Virginia Opossum*, and refers to Linnæus under the name of *Didelphis marsupialis*. In Gmelin, it stands as *Didelphis opossum*.

The Opossum is an inhabitant of the temperate regions of North America. Although it is abundant in New-Jersey, I have never seen it in this State, but have heard that it has been noticed in the southern counties on the west side of the River Hudson, and it will probably be found in the western counties. I am not aware that it has ever been observed east of the Hudson. It inhabits chiefly wooded districts, and, as might be inferred from its structure, passes most of its life on trees. It feeds on birds and their eggs, on wild fruits, especially the persimon (Diospyros virginiana.) It is an excellent article of food, resembling in flavor that of a sucking pig. When pressed by hunger, it occasionally prowls round the barnyard, and commits ravages among the poultry. Its westerly distribution extends to the Pacific, as it has been found in California, and it is asserted to be common in Mexico, and inhabits all the intertropical regions; but it is possible that it may have been confounded with two other closely allied species found in South America.

ORDER III. CARNIVORA.

Furnished with sharp and strong claws. Three kinds of teeth, differing considerably from each other. Living exclusively on animal substances, and the more exclusively so as their teeth are furnished with acute points. No thumbs on the fore feet opposable to the other fingers.

This order embraces animals exceedingly varied in form, such as the Bat and Seal, Shrew-moles, and Bears. It represents the Order *Feræ* of Linneus, and a portion of his *Primates*. In this State, we have the representatives of eight families.

FAMILY I. VESPERTILIONIDÆ.

Anterior fingers excessively prolonged; the anterior and posterior extremities connected by a more or less naked expansion of the skin, adapted to flight. Two pectoral mammæ. Penis external, pendulous. Incisors varying in number. Summits of the cheek teeth ending in sharp points. Prey upon the wing. Hybernate.

This is a natural and very numerous group, comprising more than one hundred and fifty species, distributed over the globe. These are arranged by modern systematic writers under twenty-seven genera, and this has been subsequently carried to forty-eight genera. Their habits are nocturnal, feeding almost exclusively upon winged insects. Some species, however, are occasionally seen flying about in open daylight. We have noticed five species in the State of New-York, all included under one genus.

GENUS VESPERTILIO. *Linneus.*

Incisors two to four above and six beneath; anterior cheek teeth simple conic; the posterior with sharp points. No nasal appendages; the ears lateral and distinct. The index finger of one joint. Tail rarely exceeding the interfemoral membrane.

Obs. In this latitude, the Bat, on the approach of winter, retreats to cavities in trees, or to caverns, and becomes perfectly torpid. They bring forth from one to three at a birth, in the months of June and July. Period of gestation unknown.

THE NEW-YORK BAT.

VESPERTILIO NOVEBORACENSIS.

PLATE I. FIG. 2.—(STATE COLLECTION.)

New-York Bat. PENNANT, Arctic Zoology, Vol. 1, 184.
Vespertilio noveboracensis. LINNEUS, Syst. Gen.
Red Bat. WILSON, Am. Ornithology, Vol. 6, plate 50
Vespertilio rufus. WARDEN, Disc. U. S. Vol. 5, 603.
Vespertilio noveboracensis. HARLAN, Fauna Americana, p. 20.
V. id. GODMAN, Am. Nat. Hist. Vol. 1, 68, figure.
Taphozous rufus. HARLAN, Faun. Am. p. 23.
New-York Bat. COOPER, Ann. Lyc. New-York, Vol. 3, 57. KIRTLAND, Zool. Report, p. 175. EMMONS, Mass. Rep. 1840, p. 9.

Characteristics. Color reddish tawny. Brachial membrane naked above, except near the body and at the base of the phalanges. A patch of white hairs at the insertion of the wings.

Description. Ears broad, with an obtuse tip and a naked anterior lobe. Nostrils tubular, with a few short black whiskers on the sides of the cheeks. Interfemoral membrane broader than long, including the entire tail, and is supported by a bony process from the tibia on each side a quarter of an inch long. This process is most obvious from beneath. The membrane is naked beneath for more than two-thirds of its extent; hairy above. Hind feet with five subequal toes, of which the interior is shortest. Brachial membrane entirely naked, except near the thumb. Dental formula: Incisors, $\frac{2}{6}$; canines, $\frac{2}{2}$; cheek teeth, $\frac{8}{8}_{0} = 30$.

Color, of the head and cheeks reddish tawny, which is also the general color of the fur on the body above, frequently mixed with white, and producing a light cream or hoary color, and often a bright chesnut red. A small portion of the brachial membrane nearest the body, and the whole of the interfemoral membrane, together with the legs, covered with tawny hair; this is longest, and varied with white, on the sides of the body. Beneath, the general color is somewhat lighter, and the fur extends but a short distance down the interfemoral membrane. A white patch of hair on the sides of the body near the insertion of the wings, most conspicuous on the under side. The brachial membrane is dark brown, with lighter colored reticulations, and entirely denuded, except near the thumb-nail above and a short distance along the course of the forefinger, where we may observe a few white hairs. On the under side of this membrane is a patch of light tawny hair at the base of the phalanges, and extending sparsely along the forearm.

Total length,	3·0 – 4·0.
Length of tail,	1·5 – 1·8.
Spread of wings,	10·0 – 12·0.

This is the most common species in our State, and can scarcely be confounded with any other unless it may be with the Hoary Bat. It is usually, however, smaller, but resembles it in

its dentition, and frequently in its external markings, even to the white spot at the insertion of the wings. Its strongest distinctive character is to be found in its general tawny hue, and the absence of a hairy patch at the elbow or first joint of the forearm. One of the specimens, which furnished us with the preceding description, is among the largest we have seen, approaching very nearly in size to the hoary bat.

The geographical range of this species, as far as it has yet been noticed, extends between the thirty-third and forty-second parallels of latitude, and from Massachusetts to the Rocky Mountains. According to Kirtland, it is comparatively a rare animal in Ohio. Except in the northern mountainous districts, it occurs in every part of this State.

THE HOARY BAT.

VESPERTILIO PRUINOSUS.

PLATE II. FIG. 2.—(STATE COLLECTION.)

Vespertilio pruinosus.		SAY, Long's Expedition to the Rocky Mountains, Vol. 1, p. 168.
V.	*id.*	HARLAN, Fauna Americana, p. 221. GODMAN, Am. Nat. History, Vol. 1, p. 68, figure 3.
V.	*id.*	RICHARDSON, Fauna Boreali Americana, Vol. 1, p. 1.
V.	*id.*	COOPER, Ann. Lyceum N. Y. Vol. 4, p. 54.
V.	*id.*	WHEATLAND, Essex Journal Nat. Hist. Vol. 1, p. 76. EMMONS, Mass. Rep. 1840, p. 8.

Characteristics. Greyish above. Margin of the interfemoral membrane naked; a small white hairy patch at the elbow and wrist above. Lips and chin black. Throat with a fawn-colored band.

Description. Body robust. Ears broad, short and rounded; naked on the superior margins, hairy within, and with a tuft of fawn-colored hair behind the anterior margin, which is broadly dilated and free at the base. Tragus or inner ear hairy externally, convex on its outer margin, concave on its inner margin, and terminating in an obtuse tip. Wing membrane naked above the small tufts noted in the specific phrase. Interfemoral membrane hairy, except along the external margins. Beneath, the humeral membrane is covered with dense hair except on the margin; at the insertion of the wings behind the humerus, there is a broad patch of hair extending to the elbow, and forming a band 0·4 broad, along the course of the forearm to the wrist; the remaining part of this membrane is naked. Forearm longer than the tail, which is entirely included in the membrane. Richardson, however, states that in the specimen which he examined, there was a very slight smooth projection of the tail. This may be the case in prepared specimens, but I have not noticed it in recent subjects. Tibial processes stout, and 0·8 long. Dental formula: Incisors, $\frac{2}{6}$; canines, $\frac{2}{2}$; cheek teeth, $\frac{1}{1}\frac{0}{2} = 34$.

Color. Upper part of the head, light yellowish; the parts surrounding the mouth and nose, deep blackish brown; posterior part of the ears two colors, light yellowish at the base, black along the margins; internally there are short greyish hairs; margin black and naked, except on the portion near the nose, where there is a patch of short light yellowish

hairs. Body and interfemoral membrane above covered with hair, black at the base, then light yellowish, subsequently black, and finally tipped with white. From this results a general grey or hoary appearance, which suggested the specific name. Towards the margin of the interfemoral membrane, this hoary color passes into faint reddish. Humeral membrane dusky, with a reddish tint near the shoulder. Beneath, a buff colored band or cravat surrounds the neck; the breast colored like the back, and passing into clay yellow on the abdomen and the anterior part of the interfemoral membrane.

Total length,	4·8.	Thumb nail,	0·4.
Length of tail,	1·6.	Tibia,	0·8.
Fore arm,	2·0.	Spread,	15·5.

This is the largest species observed in this State. It appears to be less nocturnal than many of the other species, and retires quite late to its winter quarters. On the 12th December of this year, (1841,) I noticed two flying about quite actively shortly before noon. It is not a common species. Its geographical range is very extensive. It was first discovered by Nuttall, at Council Bluff on the Missouri; subsequently seen in Georgia by Le Conte, and since noticed in Pennsylvania and Massachusetts. It was found by Richardson as far north as the fifty-fourth degree of latitude. Nothing is known of its habits.

THE LITTLE BROWN BAT.

VESPERTILIO SUBULATUS.

PLATE III. FIG. 2.—(STATE COLLECTION.)

Vespertilio subulatus. SAY, Long's Exped. Vol. 2, p. 65.
V. carolinensis, var. HARLAN, Fauna Amer. p. 22. GODMAN, Am. Nat. Hist. Vol. 1, p. 71.
V. domesticus. GREEN, Cab. Nat. Hist. Vol. 2, p. 290.
V. lucifugus. LE CONTE, McMurtrie's Cuvier, Vol. 1, p. 431.
V. subulatus. COOPER, Ann. Lyc. Nat. Hist. N. Y. Vol. 4, p. 61.
Say's Bat. RICHARDSON, Fauna Bor. Am. Vol. 1, p. 3.

Characteristics. Small olive brown above; greyish beneath. The fore-arm and tail subequal. Tragus awl-shaped.

Description. Head short and broad. Ears membranous, longer than broad, ovate; posterior margin broadly emarginate, somewhat narrowed at the tip. Within sparsely hairy; more densely so at the base, and ascending sparsely along the anterior margins, which are plaited. Tragus linear, subulate, from 0·2–0·3 in length, ending in an obtuse tip. Interfemoral membrane broad; naked, including the tip of the tail. In dried specimens this tip appears beyond the membrane. Fur remarkably soft and silky, and the membranes very thin and delicate. Dental formula: Incisors, $\frac{4}{6}$; canines, $\frac{2}{2}$; cheek teeth, $\frac{12}{12} = 38$.

Color. In the neighborhood of the mouth and chin the hair is of a deep brown, approaching to black. Beneath, the fur is deep brownish black at the base, and light yellowish at the

tips, forming, by its admixture with other hairs, a uniform yellowish grey. Above, the fur is also brownish black at base, and olive brown on the surface.

Total length,	3·3.	Forearm,	1·0.
Tibia,	0·7.	Spread,	9·0.
Tail,	1·0.		

The Little Brown Bat appears to be subject to great variation in size and color. Usually they are scarcely one-half the preceding dimensions. I have received from Prof. Emmons, several specimens of this species, obtained in September from the northern districts. They are smaller, and of a dark hue approaching to black. The plaits on the anterior margins of the ear were not observed. The fur longer than in the specimen described above, which was the same employed by Mr. Cooper in his Monography. The ears appeared to be proportionably longer; but in the black color surrounding the mouth, and in the other characters, no difference could be observed. In one of the specimens, the dorsal surface was varied with black and grey; and in another, dark brown intermixed with olive brown.

The Little Brown Bat can scarcely be confounded with any other species found in this State, unless it be with the Carolina bat. It is found in almost every part of the Union, and ranges as far as the fifty-third degree of north latitude. It has been observed in New-Hampshire, Arkansas at the eastern base of the Rocky mountains, on the Columbia river, in Georgia, Pennsylvania, Carolina, &c. In this State, I have obtained specimens from the northern and western districts. It is very numerous about Lake Oneida, and in the southern counties.

THE SILVER-HAIRED BAT.

VESPERTILIO NOCTIVAGANS.

PLATE I. FIG. 1.—(STATE COLLECTION.)

Vespertilio noctivagans, LE CONTE, McMurtrie's Cuvier, Vol. 1, p. 431.
V. audubonii, HARLAN, Am. Jour. Geol. Vol. 1, p. 220, pl. 4.
V. id. ID. Med. and Phys. Researches, p. 26, plate.
V. noctivagans, COOPER, Ann. Lyc. N. Y. Vol. 4, p. 59.

Characteristics. Black, with silvery hairs above and beneath; above, a whitish collar across the shoulders, extending upwards towards the ears. Tail beyond the membrane.

Description. Body densely hairy, particularly in the region of the neck. Ears large, broad, and obtusely ovate; the outer border with a fold, producing a broad and distinct emargination above, and an abrupt one beneath. Tragus small, ovate, dilated beneath. Nostrils terminal, sub-bilobate. Interfemoral membrane including all but the two last joints of the tail; densely hairy on the anterior part of its upper surface, becoming more sparse as it approaches the extremity of the tail; beneath, it is nearly naked. The bony processes of the tibia, supporting the sides of the membrane, are an inch long. Brachial membrane naked, except near

its junction with the body. Feet hairy, with five subequal toes. Dental formula: Incisors, $\frac{4}{6}$; canine, $\frac{2}{2}$; cheek teeth, $\frac{10}{10} = 34$. Two of the upper incisors have bilobate tips, with a free space between them.

Color. Above of a uniform black or brownish black, the wing membrane being of a somewhat lighter color. On the back there is a sort of collar, composed of white or silver-tipped hairs surrounding the neck, ascending towards the ears, and descending in some instances a short distance down the back. Traces of these white tipped hairs may be observed towards the interfemoral membrane. (In one individual, sent to me by the Revd. Mr. Linsley, from Elmwood, Connecticut, the whole upper surface was varied with white hairs.) Beneath, these silvery hairs are distributed over the breast and abdomen, and more distinctly on the sides towards the brachial membrane.

Total length,	3·6.	Alar extent,	10·0 – 11·0.
Length of tail,	1·4.		

The Silver-haired Bat is common on Long-Island, and the southern counties of the State. As far as it is yet known, Connecticut, and possibly Massachusetts, forms its extreme northern range. It has been observed in the Atlantic States as far south as Georgia. The female from which the foregoing description was taken, is much larger than the male. In common with the other species, it takes refuge during the day in hollow trees. Its history is yet incomplete.

THE CAROLINA BAT.

VESPERTILIO CAROLINENSIS.

PLATE II. FIG. 1.—(STATE COLLECTION.)

Vespertilio carolinensis. GEOFFROY, Ann. Mus. Vol. 8, p. 193, pl. 47 and 48.
V. id. LE CONTE, McMurtrie's Cuvier, Vol. 1, p. 481.
Carolina Bat. COOPER, Ann. Lyc. N. Y. Vol. 4, p. 60. EMMONS, Mass. Rep. 1840, p. 10

Characteristics. Large; chesnut color above; forearm longer than the tail.

Description. Ears large, naked, higher than broad. Tips subacutely rounded, emarginate on the posterior edge. Tragus long and sublinear, resembling that of the little brown bat, but more obtuse at the tip. Interfemoral membrane naked above and beneath, and not including the extreme tip of the tail. The bony processes supporting this membrane are very stout, and nearly an inch long. Dental formula: Incisors, $\frac{4}{6}$; canines, $\frac{2}{2}$; cheek teeth, $\frac{8}{10} = 32$. The two medial incisors notched or bifid towards the tip.

Color. Jaws and snout dark brown. Body above bright glossy chesnut; beneath of the same color, but of a lighter shade, and in some lights appearing as if intermixed with grey. Base of the fur brown, with a few hairs of a greyish hue.

Total length,	3·8.	Tibial process,	0·9.
Length of tail,	1·5.	Spread,	12·0.
Tibia,	0·8.		

This species can scarcely be confounded with any other species, unless it may be with the New-York bat; from this, however, it is distinguishable by its greater size, and its distinct color. The bony processes supporting the interfemoral membrane are so stout and long, as to subtend that membrane, and alter its usual triangular form.

The Carolina Bat is found along the Atlantic States, from Georgia to Connecticut. I have obtained it from Kings county, and Prof. Emmons has observed it at Albany, in the months of February and March. Its season of torpidity is probably of short duration.

(*EXTRA-LIMITAL.*)*

V. monticole. (Bachman, Proceed. Ac. Sc. p. 92.) Fulvous; smaller than *subulatus*; ears shorter; tragus less than half the length of the ear. *Virginia.*

V. virginianus. (Id. ib. p. 93.) Sooty brown, above ash brown; a little larger than the preceding; ears slightly longer and more acute; incisors above simple; interfemoral membrane naked; a black spot at base of the wing. *Virginia.*

Genus Molossus, *Geoffroy.* Head and muzzle very large; canines varying from $\frac{2}{0}$ to $\frac{4}{0}$; incisors in the upper jaw bifid; tragus small forward and outside; interfemoral membrane enveloping about half the tail; nose simple.

M. cynocephalus. (Cooper, Ann. Lyc. Vol. 4, p. 65, figure.) Sooty brown; ears crimped on their posterior half; lips thick and pendent; incisors $\frac{2}{6}$. *Southern States.*

M. fuliginosus. (Id. ib. p. 67, figure.) Sooty brown; incisors $\frac{2}{4}$; more than half the tail free. *Southern States.*

Genus Plecotus. *Geoffroy.* Incisors $\frac{4}{6}$; two large fleshy appendages in the form of crests, between the eyes and nostrils; ears enormously dilated, united at their bases and fringed on their internal margins; tail projecting beyond the membrane.

P. leconti. (Id. ib. p. 72, figure.) Dusky; beneath towards the tail, white; tragus less than half the length of the ears. *Southern States.*

P. townsendi. (Ac. Sc. Vol. 7.) Ferruginous, beneath reddish ash; tragus half the length of the ears; larger than the preceding. *Columbia river.*

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* Under this head, we include short notices of species observed in the United States, or the adjacent regions, but which we have not seen in this State. The authority for the species must, of course, rest with their respective describers.

FAMILY II. SORECIDÆ.

No lateral membranes performing the functions of wings. Incisors elongated, or spoon-shaped. Molars varying in shape, and with conical points. Muzzle elongated, flexible, sometimes surrounded by filaments. Mammæ ventral. Fur dense, occasionally with rigid hairs or spines. Strong musky odor. Ears rarely prominent. Eyes exceedingly minute. Soles of the hinder feet applied to the ground. Nocturnal; subterranean. Some species hibernate. Comprises the smallest of the quadrupeds.

This family embraces numerous small animals, such as Moles, Shrews, Hedge Hogs, &c. all allied by similar habits. They are for the most part nocturnal, and form their habitations under ground. They all hibernate; and one genus, *Centenes*, Illiger, from Madagascar, is *said* to pass three of the warmest months of the year in a state of torpidity. They are occasionally injurious to the gardener and farmer, by destroying roots and seeds, although their chief food is composed of earth worms, grubs and other noxious animals. In this State, we have observed species illustrative of four genera, namely, *Condylura*, *Scalops*, *Sorex* and *Otisorex*.

GENUS CONDYLURA. *Illiger.*

Muzzle elongated, with radiating cartilages. Incisors six above and four below; the two intermediate above, largest; spoon-shaped. Cheek teeth fourteen above, sixteen below. Ears none. Feet five-toed; anterior claws formed for digging.

Obs. This genus was established by Illiger for the reception of a singular little animal from North America, which had been hitherto described as a mole and as a shrew. The name, although founded on an accidental character, it has been found convenient to retain. We have met with but one species in this State.

THE COMMON STAR-NOSE.

CONDYLURA CRISTATA.

PLATE IV. FIG. 1.—(STATE COLLECTION.)

Sorex cristatus. LINN. Ed. 12, p. 73.
Long-tailed Mole. PENN. Syn. Quad. Fide Erxleben.
Talpa longicaudata. ERXLEBEN, Syst. p. 118.
Radiated Mole. PENN. Hist. Quad. Vol. 2, p. 232, (fig.)
Taupe de Canada. DELAFAILLE, Essai sur la Taupe.
Long-tailed Mole. PENN. Arctic Zool. Vol. 1, p. 140.
Condylure à longue queue. DESMAREST, Mamm. p. 158.
Condylura cristata. HARLAN, Fauna Am. p. 36.
C. longicaudata. Id. ib. p. 39.
The Star-nose Mole. GODMAN, Am. Nat. History, Vol. 1, p. 100, (fig.)

Condylura longicaudata. RICHARDSON, F. B. A. p. 13.
C. macroura. Id. ib. p. 284, pl. 24.
C. longicaudata and *macroura.* EMMONS, Mass. Report, 1840, p. 17.

Characteristics. Color of a nearly uniform brownish black. Tail more than half the length of the head and body. Length 7.

Description. Body cylindrical throughout, without any very distinct neck. Fur exceedingly dense and fine. Head with a slender elongated muzzle, terminating in a vertical circular disk, of from eighteen to twenty subequal cartilaginous fibres; of these, the two superior and four inferior are shortest, and not in the same plane with the others. These fibres are 0·2 long. The eyes exceedingly minute, and not easily discovered; but they may be found by examining the space above the angle of the mouth, where three or four rigid subequal hairs are apparent. Whiskers 0·4 long, light-colored at the tips, and curved forwards. A large orifice in place of an external ear, not projecting above the skin. Fore feet short, with broad robust palms; on their upper surface a series of horny scales, somewhat analagous to those on the feet of birds; on the edges of the palms, these scales are accompanied with rigid hairs. The interior of the palms with small circular scales. The fingers gradually increase in size to the fourth from the exterior; the outer equals the second from the interior. The claws are flattened, obtusely pointed, and channelled beneath. Hind feet placed far back, and quite feeble; the toes distinctly separate and scaly; the claws long, sharp, compressed, and channelled beneath. Tail sub-cylindrical, sparsely hairy, permitting the scales to be seen beneath, and pencilled at its tip. In cabinet specimens, the tail often appears knotted throughout, and strangulated at its base. The jaws present the remarkable peculiarity of two spoon-shaped incisors above and four beneath. In the upper jaw, on each side of these, are two other incisors, the first of which is long, and resembles a canine tooth; the other is separated by a small interval from the preceding, is very small, conic and compressed. The incisors of the lower jaw are spoon-shaped, approximated and subequal. The cheek teeth in both jaws vary much in form and size, the first of the lower jaw being long and pointed like a canine tooth.

Color, throughout of a nearly uniform deep brownish black, varying somewhat according to the light in which it is viewed. The base of all the fur is of a deep slate color; beneath of a lighter hue, and may be termed ashen or plumbeous. Feet whitish. I have noticed a specimen which was of a uniform soiled white.

Total length,	7·5.	Hind leg,	1·1.
Length of tail,	2·8.	Breadth of palm,	0·4.
Of fore feet,	0·7.	Girth of body,	3·5.

The name given by Illiger, which was founded on a figure which exhibited the knotted appearance of the tail in a desiccated specimen, and therefore not characteristic, it has been nevertheless found convenient to retain, as designating a remarkable generic type. Pennant, in his Synopsis of Quadrupeds, 1771, published a notice and figure of what he terms the

long-tailed mole. Linnæus, in his 12th edition, 1776, published his description of the *Sorex cristatus*. The following year, Erxleben gave the name of *longicaudata* to Pennant's mole. We suppose that all these refer to the same species, Linnæus having described from an injured specimen. In the third edition of the Synopsis, (possibly in the second, which we have not seen,) which was published under the title of the History of Quadrupeds, Pennant introduces the Linnean *cristatus*, with a deplorable figure, and adds his long-tailed mole with a figure scarcely superior to the other. From his account, it is apparent that he described an immature star-nose for the *cristatus*. In his Arctic Zoology, having in the interval received specimens from this country, he describes some additional particulars; of these the most important diagnostic character attributed to the *cristatus*, is "toes of the hind feet closely connected;" and yet Desmarest, *Op. cit.* who has given a detailed description, expressly states "Pieds de derrière, etc." "Hind feet with the toes deeply divided, all the toes free;" and this accords with our own observations. The account of the *longicaudata* by Desmarest, is evidently copied from Pennant by some culpably careless transcriber.

From these observations, we would infer, 1st, that the *cristatus* of Linnæus is the only species yet discovered in this country, and is identical with the *long-tailed mole* of *Pennant;* 2d, that the name of *cristatus* is entitled to priority; 3d, that if the name *longicaudata* ever appears in the systems, it must be attributed to *Erxleben*, and not to *Pennant*.

The *C. macroura* of Harlan, although adopted, described in detail and figured by Richardson, we cannot, after a careful comparison of descriptions, acknowledge to be a distinct species. It is well known that the tail undergoes, at certain seasons, changes in shape and bulk; and species founded on such characters should be received with great reserve. We have specimens of the common *star-nose* differing in no respect from the *macroura*, except in its tail not being quite as much dilated as in the figure of Richardson. It is proper, however, to add, that we have not been enabled to examine the individual from which Dr. Harlan drew up his description; and his account purports to have been derived from a cabinet specimen.

The Star-nose burrows in moist places near the surface, forming elevated ridges like the Shrew-mole, and chambers for rearing their young. These are most numerous near the borders of streams. When observed in confinement, they continually attempt to hide themselves by digging, and the cartilaginous tendrils around their nose are in perpetual motion. Godman states that they feed readily on flesh, either raw or cooked, and exhibit no willingness to eat vegetable matter.

The Star-nose is abundant throughout New-York, where it is occasionally called the *Button-nose Mole*. Its geographic limits are not yet established. It is, however, known at present to be found from Hudson's Bay to Virginia.

GENUS SCALOPS. *Cuvier.*

Muzzle elongated and simple, flexible, cartilaginous. Eyes minute, and scarcely visible. No external ears, but simply a minute aperture. Feet short, five-toed; the hand broad, with fingers joined together by the integuments to the last phalanx; the claws long and flat. Hind feet slender, with delicate hooked nails. Teeth: Incisors, $\frac{2}{3} - \frac{3}{4}$; *cheek teeth,* $\frac{1}{1}\frac{3}{2} - \frac{2}{2}\frac{9}{9} = 34 - 46$. *A musky gland near the vent.*

THE COMMON SHREW-MOLE.

SCALOPS AQUATICUS.

PLATE IV. FIG 2.—(STATE COLLECTION.)

Sorex aquaticus. LIN. 12 ed. p. 74.
Brown Mole. PENN. Arct. Zool. Vol. I, p. 141.
S. aquaticus. SCHREBER, Saugthiere, pl. 158, (indifferent.)
S. canadensis. HARLAN, Fauna Americana, p. 32.
The Shrew-mole. GODMAN, Am. Nat. Hist. Vol. I, p. 84, fig. 3.
Scalops canadensis. RICHARDSON, F. B. A. Vol. I, p. 9.
Shrew-mole. EMMONS, Massachusetts Report, 1840, p. 15.

Characteristics. Fur glossy, and like velvet; its most usual color silvery grey, brown. Length, 6 – 8 inches. — VAR. *a*, bright tawny; *b*, hoary.

Description. Body cylindrical, without any distinctly apparent neck. Fur thick, velvety and lustrous. Head small, with its muzzle elongated to a point. The muzzle about a quarter of an inch long, and naked towards its extremity, which is truncated. The nostrils are oblong, and placed just above its smooth truncated extremity. Eyes exceedingly minute, and completely concealed among the fur. No external ear; the auditory opening entirely concealed in the fur about three-quarters of an inch behind the eye, and just admitting the point of a pin. Fore feet apparently naked, but in fact covered with short white hairs. The five phalanges are united at the base of the claws, which are large, white, flat, slightly curved, and brownish beneath near their bases. According to Godman, it is furnished exterior to the thumb with an additional bone articulated to the wrist, and a similar rudimentary one on the external edge of the hand. Hind feet slender, thinly covered by hair, and with small white compressed claws. Tail thickest in the middle, tapering to a point, and sparsely furnished with short hairs. The descriptions of the teeth, as given by various authors, vary not only in the names given to the different kinds of teeth, but likewise in the total number; the incisors, for instance, are confounded with the canines, these latter with the molars. Hence, when the second cheek tooth on each side is lost, the first, which is closely in contact with the incisor, is considered as a second incisor; and thus confusion arises from the inspection of a single head, or from immature or imperfect ones. Desmarest accordingly assigns thirty teeth as the total number; F. Cuvier thirty-six, in which he is copied by Godman; and Richardson, with a fully developed skull, enumerates forty-four. We have but

once seen a skull with this number; and this formula, which has been erroneously printed, has, by another error, been applied to the star-nose.

Color. The entire animal is covered with a beautiful glossy fur of silvery grey brown, somewhat lighter about the head, where it assumes a slight yellowish tinge; but this is far from being a constant character. Muzzle of a delicate flesh color. Tail and feet whitish. Varieties are not uncommon, of a uniform bright tawny or orange, and occasionally hoary.

Total length,	6·0.
Tail,	1·0.

This little animal, from its appearance and habits, is commonly called a *mole;* but from this it is widely different. It has the burrowing habits of the common mole of Europe, but does not exclusively occupy the vicinity of rivers and water courses, as its name would seem to imply. It may naturally prefer moist places; for the earth is more easily excavated in such situations, and its favorite food, the earth worm (*Lumbricus terrenus*, Say,) is there found in the greatest abundance. They have also been observed in the dry sandy pine barrens of New-Jersey, in search of the larvæ of ants. Their burrows are usually from one to three inches from the surface, although occasionally much deeper. He is well known as the pest of gardeners, defacing the smooth walks, and injuring the appearance of the beds. It may well be doubted, however, whether the good he does in destroying grubs, worms, etc. does not more than compensate for the injury he is supposed to occasion to roots and germinating seeds. It is asserted that he has a great aversion to the castor-oil plant (Palma Christi), and that he will avoid gardens in which they grow. Our own experience would lead us to attach little importance to this remedy.

The Shrew-mole, for its size, is remarkably strong, and is capable of domestication. In eating, it employed its flexible snout to thrust food into its mouth, and frequently burrowed in the earth in order to eat its food undisturbed. An interesting account of the habits of the Shrew-mole is given by Dr. Godman,* to which we refer the reader.

We take this opportunity to state, that the existence on this continent of the true mole of Europe, has frequently been asserted and denied. Dr. Harlan, in his *Fauna*, p. 43, has published from the manuscripts of Bartram, notes of an animal which may have reference to a true mole. Of this several varieties are noted, which, unless Bartram had the shrew-mole in view, would seem to indicate the existence of a very common species. It is to be regretted that Bartram's notes are silent respecting the dentition, which would have settled all doubts on the subject. Godman, Vol, 1, p. 106, discredits its existence; and the translator of the American edition of Cuvier's *Règne Animal*, coincides with this opinion. One of the most recent writers on our Mammalia, states, however, that there are several true moles in the

* Rambles of a Naturalist, by J. D. Godman, Philad. 1833.

collection of the Zoological Society of London, undoubtedly from America, but the particular district was not known.

The Shrew-mole has a wide geographical range, being found from Carolina to the fiftieth degree of north latitude, and from the Atlantic to the shores of the Pacific.

GENUS SOREX. *Linneus.*

Cutting teeth, $\frac{2}{2}$; *the upper curved and notched at the base. Head elongated; snout produced and moveable. Ears short, rounded, broader than long, concealed, occasionally not elevated above the skull. Feet short, with five nails; phalanges small, separate, with feeble hooked nails. A series of glands, exhaling a strong odor, along the flanks. Cheek teeth,* $\frac{16-20}{10}$.

Obs. This genus contains some of the smallest of our quadrupeds. The English translator of Cuvier's *Règne Animal*, asserts that no genuine Shrews are to be found, except on the ancient continent; an assertion which is contradicted by the fact that thirteen species have been described in North America, and when farther investigations are made, the number will probably be much increased. It will be found that the characters of the genus will require careful revision, and several small but distinct groups will be established. The habits of the animals of this genus are nocturnal, and they burrow for the most part in the ground like the shrew-mole. All are said to be fond of the water, swimming with great ease, and diving well.

DE KAY'S SHREW.

SOREX DEKAYI.

PLATE V. FIG. 2.—(STATE COLLECTION.)

Sorex dekayi. Bachman, Acad. Sc. Vol. 7, p. 377, pl. 23, fig. 4.

Characteristics. Uniform dark bluish throughout. Chin light brown. Feet reddish brown. Total length 5 to 6 inches.

Description. Body subfusiform, tapering gradually to the snout, which is elongated, emarginate, and covered near the extremity with short hairs. Head small; nostrils terminal. Eyes visible, and 0·6 distant from the snout. No projecting external ear. Whiskers numerous, whitish; the longest were five-tenths of an inch long. The fore feet 0·5 long, sparsely hairy, with scaly phalanges; the internal toe or thumb is articulated high up, and is shorter than the external; the second and fourth subequal; the middle longest; claws short, white, and feebly channelled beneath for two-thirds of their length from the tips. Base of the claws enlarged, and compressed laterally. Hind legs placed very far back, 0·6 long, and sparsely hairy; the three middle claws subequal. Tail very slender, subquadrate, with

adpressed hairs, and slightly pencilled at the tip. Teeth white at the base, piceous at the tips. Dental formula: Incisors, $\frac{2}{2}$; cheek teeth, $\frac{16}{16} = 30$. (Bachman, in his valuable monograph cited above, attributes 18 cheek teeth to this species.) Above, the incisors are incurved, pointed, channelled behind, with a broad base dilated posteriorly, and furnished with a distinct point; the four succeeding cheek teeth on each side small, with their external points most elevated; the first of the remaining jaw teeth largest of all, with four and occasionally five distinct points; the remainder smaller, and irregularly pointed. In the lower jaw, the incisors are long, not contiguous, and projecting horizontally from the jaw; they are curved, with pointed tips, and channelled within; the external edges are sharp, with two and occasionally three distinct emarginations, the base laterally compressed. The first jaw tooth is a small pointed prism, lying immediately on the base of the incisor, and directed forwards; the next is still over the root of the incisor, somewhat larger, with an oblique cutting edge; the third is five-pointed, and largest of all; the last is somewhat larger than the second.

Color. Uniform glossy slate, or if we take a more definite standard, resembling the fur of the star-nose. Beneath, merely a shade lighter; and in particular lights there is no perceptible difference in the color, the whole appearing hoary and lustrous. Chin and nose light brown. Feet flesh-colored.

Length of head and body,	4·8.	To the end of the hairs,	0·9.
Length of tail,	0·8.	Girth,	2·7.

I am indebted to Mr. Bell for an opportunity of examining other specimens of this Shrew, from Rockland county. In one, the length of the head and body was 3·5; of tail, 0·7. In others, the dimensions were somewhat smaller. The specimens from which our description is taken, were obtained from Queens county, and were described and exhibited before the Lyceum of Natural History nearly fifteen years ago. I then gave it the name of *concolor*, but the description was never published. Dr. Bachman, who examined the same specimen, gave the present name, which, by the just and rigid rule of priority, must be preserved. It is nearly allied to *brevicaudus*, but is larger and more robust in its form.

This Shrew is found in Albany county, and in the southern parts of the State. Its geographical range along the Atlantic extends from Massachusetts to Virginia.

THE SHORT-TAILED SHREW.

SOREX BREVICAUDUS.

(STATE COLLECTION.)

Sorex brevicaudus. SAY, Long's Exped. Vol. 1, p. 164.

Short-tailed Shrew. BACHMAN, Ac. Sc. Vol. 7, p. 381. HARLAN, Fauna. p. 29. GODMAN, Am. Nat. Hist. Vol. 1, p. 79, figure. KIRTLAND, Ohio Report, p. 175. LINSLEY, Am. Jour. Sc. Vol. 39, p. 388. EMMONS, Mass. Rep. 1840, p. 13.

Characteristics. Blackish, plumbeous above. Nose livid brown. Tail nearly as long as hind feet. Total length, 4·0 – 4·5.

Description. Fur very long. Head large; eyes very minute. Fore feet naked, the hind ones sparsely covered with hair. Nose emarginate. Auditory foramen large, with two distinct half divisions, sparsely hairy. Nails nearly as long as the toes. Tail sparsely covered with hair. Teeth: Incisors, $\frac{2}{2}$; cheek teeth, $\frac{1}{1}\frac{3}{0} = 32$.

Color. Above, blackish lead when looked at from before, and silvery lead when viewed in an opposite direction: paler beneath. Teeth black; nose livid brown; feet white.

Length of head and body,	3·2 – 3·5.
Tail,	0·9 – 1·0.

I have seen several specimens of this animal from the opposite shore of New-Jersey, and have heard of its capture near Albany, but have never had the fortune to meet with it in this State. Mr. Linsley, in the work cited above, states that he has taken it in Connecticut, answering exactly to the description given by Godman.

Since the above was written, I have had an opportunity of examining a recent specimen from Queens county, which I refer to this species with the following description:

Rostrum robust, broad. Whiskers numerous, long, radiating; those along the margin of the mouth 0·5 long. A projecting fleshy septum just anterior to the two upper incisors, and extending nearly between them. Fur thick, moderately long, dark brown, very sparse around the region of the mouth and on the extremities, rather allowing the skin beneath to be seen; rather more dense on the tail. Nose dark brown, bifid. Eyes with a small naked space around them, 0·55 distant from the nose. Auditory hole large, transverse, narrowed beneath, naked, with an oblique septum across the upper half, and a small lobe near the middle, about 0·5 posterior to the eye. Fore feet 0·5 long; three toes subequal, longest; outer toe slightly longer than the inner. Tubercles on the palms six; two in a line behind the inner toe, and two behind the outer; the fifth between the base of the second and third toes, counting from the outside, and the sixth is placed at the base of the fourth toe. On the hind feet, the tubercles are similar in number and situation, but are larger and more distinct. When the animal lies on its back, with the hind legs extended, the claws reach beyond the middle of the tail. Tail cylindrical, very slightly tapering.

Total length,	4·00.
Of the tail,	0·75.
Hind feet,	0·75.

THE SMALL SHREW.

SOREX PARVUS.

Sorex parvus. SAY, Long's Exped. Vol. 1, p. 163. LINSLEY, Am. Jour. Vol. 39, p. 388.
Small Shrew. GODMAN, Am. Nat. Hist. Vol. 1, p. 78, pl. fig. 2.

Characteristics. Color brownish ash above, ash beneath. Tail one-third the length of head and body. Total length 3·0 – 3·5.

Description. I have not had an opportunity of examining this species; but as it has been found in Connecticut, it will in all probability be detected in this State. We subjoin the description given by Say, the original describer: "Body above brownish cinereous, beneath "cinereous; head elongated; eyes and ears concealed; whiskers long, the longest nearly "attaining the back of the head; nose naked, emarginate; front teeth black, lateral ones "piceous; feet whitish, five-toed; nails prominent, acute, white; tail short, sub-cylindric, of "moderate thickness, slightly thicker in the middle, whitish beneath. Length of head and "body, 2·4; of tail, 0·75."

Richardson, p. 8, states that a specimen obtained at Behring's Straits, is probably to be referred to this species: "Dark brownish grey above, and grey beneath; length of head and "body 2·3, tail 1·0."

Mr. Linsley, *Op. sup. cit.*, describes his *parvus* with the following dimension: "Head and "body 2·0, tail 0·75." In a letter to me, January, 1842, he states, "though a trifle shorter "than your *Otisorex platyrhinus*, it was larger in bulk; nevertheless it could not have weighed "over 50 – 60 grains, the otisorex weighing 47 grains. The *parvus*, I am satisfied, could "not have been the young of *dekayi* or *brevicaudus*, from his peculiar construction being "wholly unlike either of the other three species; besides, I have both the old and young of "the latter."

FORSTER'S SHREW.

SOREX FORSTERI.

PLATE XXI. FIG. 3.

American Shrew. FORSTER, Phil. Trans. Vol. 62, p. 3, 331.
Sorex forsteri. RICHARDSON, Zool. Jour. 1823. GAPPAR, Zool. Jour. Vol. 5, p. 201.
Forster's Shrew-mouse. RICHARDSON, F. B. A. Vol. 1, p. 6.
Sorex forsteri. BACHMAN, Ac. Sciences, Vol. 7, p. 386, pl. 24, fig. 6.

Characteristics. Small; dark cinereous, tipped with brown; beneath cinereous. Fur short. Ears broad and hairy. Tail nearly as long as the body. Length four inches.

Description. Body slender. Nose elongated and divided at the tip. Ears somewhat shorter than the fur, and concealed beneath it. Whiskers long, and white and black. Fur fine and short. Feet slender, with five white and slender toes. Tail foursided, with a slight pencil of hairs at the tip. Teeth piceous at the tips, as in the most of the species. Dental formula: Incisors, $\frac{2}{2}$; cheek teeth, $\frac{8}{8}{}^{1} = 32$. The two medial incisors above, with a lobe behind; beneath, the two medial incisors with two obtuse lobes.

Color. Fur, for two-thirds of its length, dark ash above, and brown at the tips; beneath, lighter ash. Feet flesh-colored, with short yellowish white hairs. Tail dark brown above, soiled white beneath.

Total length,	4·0.	Of tail,	1·5.
Length of head and body,	2·5.	Of head,	0·8.

This hardy little animal is found as far north as the sixty-seventh degree of latitude, and was first noticed by Forster in the work cited above, notwithstanding the English translator of Cuvier asserts "that no genuine Shrews are to be found except on the ancient continent." The tracks of this species are seen frequently during winter on the snow; and this has been noticed by Richardson, even when the thermometer stood at 40 to 50 degrees below zero. They are found in all parts of the State, but we are as yet uncertain as to their southern range.

THE CAROLINA SHREW.

SOREX CAROLINENSIS.

PLATE XXI. FIG. 2.

Sorex carolinensis. BACHMAN, Ac. Nat. Sc. Vol. 7, p. 366, pl. 23, fig. 1.

Characteristics. Uniform iron grey. Tail short, flat, nearly half the length of the head. Larger than the preceding.

Description. Body rather robust. Snout long and slender, with a bilobate tip. No external ears, but simply an auditory aperture. Whiskers long, and in some lights whitish. Eyes exceedingly minute. Fore feet rather robust, covered sparsely with hairs; hind feet more slender. Nails moderate, subequal. Tail flat, with a small thin pencil at tip. Dental formula: Incisors, $\frac{2}{2}$; cheek teeth, $\frac{2\ 0}{1\ 2} = 36$; all piceous at their tips.

Color. A bright lustrous iron-grey over the surface, the base being of a slate color. Nose and feet flesh-colored. Head and body 4·0. Head 1·0. Tail 0·4.

We have referred, with some doubts, specimens of a Shrew commonly found in this State, to this species. In this we have followed Bachman, until we had an opportunity of examining a specimen in a living state. Such an occasion has not yet presented itself. In the only one which I had an opportunity to examine with any attention, the number of cheek teeth exceeded those assigned to this species by Bachman. According to this author, their nests are about a foot under ground, and composed of fibres of roots and grasses. They feed on worms, larvæ of insects, etc. This species requires farther examination.

(*EXTRA-LIMITAL.*)

S. cinereus. (BACHMAN, Ac. Sc. Vol. 7, p. 373, pl. 23, fig. 3.) Dark iron-grey above, silver grey beneath; teeth 26; length 3·3. *Carolina.*

S. richardsonii. (Id. ib. p. 383, pl. 24, fig. 5.) *S. parvus.* (RICHARDSON, Vol. 1, p. 8.) Rusty brown above, beneath cinereous; total length 4·2; teeth 32. *N. W. Territory.*

S. cooperi. (Id. ib. p. 388, pl. 24, fig. 7.) Dark brown, beneath ash; nose long and pointed; tail as long as the head and body; total length 3·5. *N. W. Territory.* The smallest quadruped yet observed in the United States.

S. fimbripes. (Id. ib. p. 391, pl. 24, fig. 8.) Dark brown above, fawn-colored beneath; feet broad, fringed at the edges; tail a little shorter than the body; total length 3·9. *Pennsylvania.*

S. palustris. (Richardson, F. B. A. p. 5.) Blackish hoary above, lighter beneath; total length 6·2 *Arctic Regions.*

GENUS OTISOREX.

Ears large and prominent, beyond the fur. Nose elongated. Eyes distinct. Tail quadrangular. Teeth, 33.

Obs. We have ventured to propose this group, founded upon a northern and southern species, both exceedingly small.

THE BROAD-NOSED SHREW.

Otisorex platyrhinus.

PLATE V. FIG. 1.—(STATE COLLECTION.)

Characteristics. Dark brown, paler beneath. Total length, four inches.

Description. Head large. Nose much elongated, and flattened vertically; bordered on each side above with long whiskers, the tips of the most posterior extending beyond the ears; a few shorter ones on the lower jaw. Extremity of the muzzle naked and blackish, bilobate at the tip; nostrils small, lateral. Eyes small, but distinct and black, equi-distant between the tip of the nose and the margins of the ears. Ears very large, rounded and membranaceous, sub-angular on the upper margin, sparsely covered within and without with long hairs; a transverse membranous septum across the auditory foramen, thinly covered with hair. Fore feet feeble, pentadactyle, 0·5 long. Toes separate, covered with short, shining, whitish hairs; internal shortest; the outer, second, fourth and third, counting from within, successively longer. Nails moderate, slightly curved. Hind feet slender, 0·8 long, sparsely covered with light rufous hairs. Tail quadrangular, slightly constricted at its base, tapering to a point, covered thinly with short hairs, but not concealing the annulations. Fur over the whole body quite long and thick, varying from 0·2 to 0·4 inches. Tongue long, sublinear, papillose with transverse rugæ. Weight, 45–50 grains. Skull elongated. Teeth minute, tinged with piceous at their tips. Dental formula: Incisors, $\frac{2}{2}$; cheek teeth, $\frac{1}{1}\frac{8}{8} = 32$. In the upper jaw the incisors are short, with broad and dilated bases: They have a double tip, the posterior being small, distant and tubercular; the five succeeding are small, the fifth being, however, so exceedingly minute as to escape observation, unless aided by the lens; the sixth with a trifid tip, and a small dilated tubercular heel; the seventh and eighth sub-

equal, larger than the preceding, with the heel more robust; the last very small, with a single colored tip on its anterior margin. Beneath, the incisors are in a line with the lower jaw, with two distant tubercles on the outer margin: The first cheek teeth small, and lying on the base of the incisor, with a single tip; the second larger, with two small eminences; the third largest of all, and with three very acute tips; the two succeeding similar in shape, but smaller.

Color. Dark cinereous, slightly tinged with dusky rufous, particularly on the upper part of the muzzle and inferior portion of the neck; beneath, ash grey.

Length of head and body,..	2·5.	Of head,.....	0·9.
Length of tail,.....	1·6.	Height of ear, ...	0·2.

I am indebted to Mr. J. G. Bell, a zealous and acute observer, for the opportunity offered of making the preceding description. It was captured last summer at Tappan, Rockland county, in the cellar of a dwelling house, having taken up its abode between the stones of the foundation. It was exceedingly agile; and when excited, emitted a shrill, twittering squeak. It ate greedily of fresh meat, but died in the course of a few days. Through the politeness of my friend, the Revd. J. H. Linsley of Elmwood Place, Connecticut, I had an opportunity of examining another specimen, which was obtained from a log in the forest in winter, near Stratford. According to Mr. Linsley, it weighed 47 grains; and he adds, "it is the smallest "quadruped I have seen, and probably the least in America."

It appears very closely allied to the Long-nosed Shrew of Bachman, but differs in its general color, its larger size, and its proportionally longer tail. Dr. Bachman inclines to the opinion that his species is aquatic in its habits.

(*EXTRA-LIMITAL.*)

O. longirostris. (Bachman, Ac. Sc. Vol. 7, p. 370, pl. 23, fig. 2.) Chesnut; nose elongated; total length 2·8. *South Carolina.*

FAMILY III. URSIDÆ.

Six incisors in each jaw. Teeth of three kinds. Feet with strong claws. Nose moveable, adapted for excavating. Walk on the soles of the feet. Carnivorous and frugivorous. Some species hybernate.

This group comprises the Bear, the Raccoon, Badger and Wolverine of this country. They can scarcely be said to be prejudicial to man.

GENUS URSUS. *Linnæus.*

Head large; body and limbs large and powerful. Covered with long shaggy hair. Grinders varying in number, the four last large and tubercular. No glandular pouch under the tail, which is very short. Incisors, $\frac{6}{6}$; *canines,* $\frac{2}{2}$; *molars,* $\frac{1\,2}{1\,4} = 42$.

THE AMERICAN BLACK BEAR.

URSUS AMERICANUS.

PLATE VI. FIG. 1.

Ursus americanus. PALLAS, Spicileg. Zool. Vol. 14, p. 6.
Black Bear. PENN. Arct. Zool. Vol. 1, p. 57.
U. americanus. HARLAN, Fauna, p. 51. GODMAN, Am. Nat. Hist. Vol. 1, p. 114. Plate.
Ours gulaire. GEOFFROY, Mem. Mus. (Variety.)
The Black Bear. EMMONS, Mass. Rep. 1840, p. 20.

Characteristics. Black or brownish black; a soiled brown or yellowish patch on each side of the nose. Facial outline somewhat arched. Young with hair wavy or curled.

Description. Ears high, oval, rounded at the tips, and distant. Soles of the feet short; the hair projects slightly beyond the claws. Fur long, straight, shining and rather soft. Tail very short. Claws short, blunt, somewhat incurved.

Color. Beside the general black color of the body, which is occasionally light brown, verging in some instances into soiled yellowish, the sides of the nose are of a fawn color; occasionally a white dash on the forehead or throat, and sometimes a small spot of the same is seen above the eyes. Length 4 to 6 feet.

The Bear, once so numerous in this State, is now chiefly to be found in the mountainous and thinly inhabited districts, where they breed. The female, after a gestation of about one hundred days, brings forth two cubs. It does not eat animal food from choice, and never unless pressed by hunger: it prefers berries and fruits. In the forests in the northern parts of the State, a tornado will sometimes sweep through a region, prostrating the pines to an extent of many miles. In the course of a few years, the wild cherry tree springs up in great numbers on this tract; and in the fruit season, it becomes the resort of numerous bears.* It also feeds upon the whortleberry, grapes, honey, persimons (Diospyros), and roots of various kinds. Its fondness for sweet things is evident whenever it enters an apple orchard, invariably selecting the sweetest kinds. It will also devour eggs, insects, and small quadrupeds and birds; but when it has abundance of its favorite vegetable food, will pass the carcase of

* The effects of such a tornado we observed in Hamilton county, in the summer of 1840, near Eighth lake. The course of the *windfall*, as it is popularly called, was from west to east. It extended thirty miles, with a breadth varying from half a mile to two miles. This occurred fifteen years ago. It has been subsequently burned over, and abounds in poplar, white birch, wild cherries, wild raspberries, etc., which attracted to this district great numbers of deer and numerous bears.

a deer without touching it. The Bear is an imitative animal; and hence, when it meets a man, it will rise on its hind legs, but is apparently soon satisfied with the comparison, and endeavors to make its escape. It is a great traveller, and when pursued by tracking, has been known to perform long journeys. It never makes immediately for its retreat; but approaches it in a circling manner. A bear was started near Schroon some years since, and after a chase of eighteen days, was finally killed. Although seldom seen during the chase, yet he appeared to be fully aware that he was an object of pursuit, and the worn and lacerated condition of his feet testified to his exertions to escape. They are numerous along the borders of the Saranac, and in the mountainous regions of Rockland and Greene. Occasionally they invade the enclosures of the farmer, in search of potatoes and indian corn. Their depredations are, however, speedily checked; for they are timid, and will never attack a man, unless previously wounded, or in defence of their young. Some of the hunters imagine that there are two varieties of the common Black Bear, viz. the short-legged and the long-legged; but others inform me that the difference is owing entirely to the fact that some are fatter and more robust, which produces an apparent difference in the length of their legs. The Yellow Bear of Carolina, and the Cinnamon Bear of the northern regions, are varieties of this species. In this State, they retire with the first fall of snow, to caverns, or to the hollow of some decayed tree, or beneath a prostrate tree, during the winter, and pass three or four months in a state of torpidity. In more southern latitudes, the hybernation is of shorter duration, and ceases to occur when the mildness of the winter enables them to procure food. They are fat when they enter their winter quarters, and much emaciated when they leave it in the spring. Indeed this condition of fatness is so necessary, that when the supply of food is cut off, instead of retiring to winter quarters, they migrate southwardly to warmer regions. Hence great numbers are occasionally known to enter our territory from the north, composed entirely of lean males, or females not with young.

The flesh of the bear is savory, but rather luscious, and tastes not unlike pork. It was once so common an article of food in New-York, as to have given the name of *Bear market* to one of the principal markets in the city. The female goes with young seven months, bringing forth two young in February or March. The oil sells for one dollar per pound, and the skin from four to twelve dollars, according to its value.

The engraving illustrative of this species was taken from a very large individual shot on the Kaaterskill mountains, Greene county, during the winter of 1839. It measured six feet and a half from the nose to the tip of the tail; and at the foreshoulders, measured three feet two inches from the ground.

(*EXTRA-LIMITAL.*)

U. ferox. (Say, Long's Exped. 2, 244. Richardson, pl. 1 and 2.) Larger than the preceding color white, brown and black intermixed; facial outline nearly straight. *Northern and western regions.*

U. maritimus. (Godman, pl. fig.) White; facial outline somewhat convex; ears small; soles of the feet very long. *Arctic Sea.*

GENUS PROCYON. *Storr.*

Head short, triangular, with a fox-like appearance. Muzzle tapering, and projecting considerably beyond the mouth. Ears small. Tail long, bushy, not prehensile. Stand on the heel of the hinder leg, but walk on the toes. Mammæ six, ventral. Feet five-toed, with large and strong nails. A glandular pouch on each side of the vent. Incisors, $\frac{6}{6}$; *canines,* $\frac{2}{2}$; *molars,* $\frac{12}{12} = 40$. *Nocturnal.*

THE RACCOON.

PROCYON LOTOR.

PLATE VI. FIG. 2.—(STATE COLLECTION.)

LINNEUS, Beskrifnung pa ett americanst djur. Vetensk. Acad. Handl. 1747, p. 277.
Ursus americanus, cauda elongata. LIN. Analect. Transalp. Tom. 2, p. 35.
Ursus lotor. LIN. ed. 12, p. 35. ROLOFF, Description d'un Quadrupede d'Amerique. Hist. de Acad. de Berlin, 1756, p. 149. SCHULTZE, Bemerkungen über den waschbären. Hamburg, 1787.
Raccoon Bear. PENNANT, Arct. Zool. Vol. 1, p. 69.
Procyon lotor. HARLAN, Fauna, p. 54. GODMAN, Am. Nat. Hist. Vol. 1, p. 163, (figure.)
P. id. RICHARDSON, F. B. A. Vol. 1, p. 36.
The Raccoon. EMMONS, Mass. Report, 1840, p. 25.

Characteristics. Brownish; a broad black patch across the eyes. Tail bushy, and ringed with black and grey. Total length 2 to 3 feet.

Description. Body rather low on the legs, and covered with long bushy hair. Ears erect, with rounded tips. Head rounded, terminating in a pointed muzzle. Feet with five toes, furnished with sharp curved claws. Soles with five stout tubercles. Pupils round. Female larger than the male. Hair on the legs and feet short.

Color varies somewhat with age, sex and season. In the very fine specimen in the State Collection, the color above is a dark grey mixed with black. Ears dingy white; muzzle black; the chin and space above the snout reddish white. The broad black band across the eyes unites under the throat; the upper edge of this band is margined with white over the cheeks and eyes. Hair beneath long and hoary. Tail annulated, with twelve alternate bands of black and light, fulvous; tip black. In the female, the black markings on the body and tail are of a deeper hue. Total length 36 inches; tail, 10.

This is a well known animal, found in every part of the State. It has been quaintly described as having the limbs of a bear, the body of a badger, the head of a fox, the nose of a dog, the tail of a cat, and sharp claws by which it climbs trees like a monkey. The Raccoon is a restless, mischievous animal, feeding on wild and domesticated fowls, frogs, lizards, fish and insects. From its fondness for water, it is most usually found in low wooded swamps, making its lair in some hollow tree, and producing four to six cubs at a litter about the beginning of April. It is susceptible of domestication. Its fur is an article of considerable value

in commerce, being used principally in the fabrication of hats. Its flesh, when young and tender, is savory, tasting not unlike pig; but in adults, is rank and disagreeable. Occasionally the raccoon commits great ravages among indian corn, while it is in a milky state; and this, together with his occasional descents upon the barn-yard, scarcely compensates the farmer for his zeal in digging up and devouring grubs or larvæ of injurious insects.

The Raccoon is found all over North America. It has been seen as high as 60° north on the Pacific Ocean. Its southern limits are not so well defined, although it is said to exist as far as Paraguay; it may possibly be confounded with another species, which, however, has not yet been clearly identified.

(*EXTRA-LIMITAL.*)

Genus MELES, *Brisson.* Body robust, low on the legs; ears short and wide; anterior nails very large. Tail short, with a glandular pouch beneath. Incisors, $\frac{6}{6}$; canines, $\frac{2}{2}$; molars, $\frac{10}{12} = 38$. Burrowing; nocturnal.

M. labradoria. American badger. (GODMAN, 1, 176, fig. RICH. pl. 2.) Hoary; a white stripe down the forehead; a greyish brown or blackish patch includes the eye, and extends to the tip of the nose. Tail 3. *Northern regions. Plains of Missouri.*

Obs. In some parts of this State, the woodchuck (*Arctomys monax*) is called *Badger;* but I am not aware that the true Badger exists here.

GENUS GULO. *Storr, Cuvier.*

Body long, and low on the legs. Soles of the hind feet capable of being applied wholly or in part upon the ground. Tail bushy. A simple fold beneath the tail, instead of a glandular pouch. Feet five-toed, with strong hooked claws. 36 – 38 *teeth. Carniverous. Nocturnal.*

OBS. This genus is arranged by some naturalists among the *Mustelidæ*, to which indeed it bears by its dental system a close relation. The *ensemble* of its characters would seem, however, to place it in its present family, making an easy transition to the next. In the latest systematic writers, four species are noted, most of them peculiar to America. The two from North America appear to differ only in color, and are considered by many as mere varieties.

THE WOLVERENE.

GULO LUSCUS.

PLATE XII. FIG. 2. — (CABINET OF THE LYCEUM.)

Carcajou. LA HONTAN, Voyage, Vol. 1, p. 81.
Ursus luscus. LIN. 12 ed. p. 71.
Wolverene. PENN. Arct. Zool. Vol. 1, p. 66. LAWSON, Carolina, figure.
Gulo arcticus. HARLAN, Fauna, p. 60.
G. luscus. GODMAN, Am. Nat. Hist. Vol. 1, p. 185, plate.
Wolverene. RICHARDSON, F. B. A. Vol. 1, p. 41.

Characteristics. Color dark brown, passing into black, with a lighter broad band on the flanks and thighs. Tail with long pendulous hairs.

Description. Body stout and compactly made, with an arched back, and little elevated from the ground. Head small, broad, rounded, suddenly diminishing to the nose. Ears small, rounded, and nearly concealed among the fur. Eyes small. Fur loose and shaggy. The tail, which scarcely exceeds six inches, is very bushy, and covered on its sides and extremity with long pendulous hairs. Legs short and thick; toes distinct, and armed with five hooked claws. Soles of the fore feet with five, and hind feet with four tubercles.

Color. There is a great variety in the general color of this animal, varying from light cream to a deep blackish brown. Its usual color is as follows: Blackish brown, becoming deeper on the sides of the face, on the back and extremities; more or less white on the chin and between the fore legs. Hair on the tail, deep black; on the legs, brownish black. A pale crescent-shaped band over the head, between the ears and the eyes. A broad band of light chesnut along the flanks, becoming dilated on the thigh, and ascending over the rump, where it meets with a similar band from the other side. The young have a uniform downy cream-colored fur. Head and body, 24·0; tail (vertebræ), 6·0; including fur, 9·0.

Although we have not met with this animal, yet hunters who have killed them repeatedly, and knew them well, have assured us that they are still found in the districts north of Raquet lake. It is, however, every where a rare species. Prof. Emmons states that they still exist in the Hoosac mountains, Massachusetts.

The Wolverene is a very troublesome and destructive animal. Like the Fisher, it has been known to follow "a sable line" of 40 – 50 miles, destroying every trap for the purpose of obtaining the bait. Much of the fictitious history of this animal is founded on the circumstance that the name of Wolverene is also applied to the *Felis rufa*, or Bay Lynx; and in this we are to account for its habit of climbing trees, etc. attributed to it by Lawson, Buffon and others. It destroys great numbers of the smaller quadrupeds. The celebrated half breed, John Hunter, informed me that it was called *gwing-gwah-gay* by the Indians of his tribe, which he interpreted "a tough thing," or as he afterwards explained it, "a hard character," in allusion to its mischievous disposition. He assured me that he had known it to be domesticated, and employed by the Indians to catch beaver.

The Wolverene was formerly found as far south as Carolina, but its southern limits at present do not extend south of the forty-second degree. To the north, it extends to the polar seas, as high as the seventy-fifth degree of north latitude.

FAMILY IV. MUSTELIDÆ.

Comprises small carnivorous animals, with long vermiform bodies on short feet. Neck long. Ears short and rounded. Tail long, rarely bushy. Digitigrade, or walking on their toes. All diffusing a strong odor, which in some genera forms a defensive weapon. Incisors, $\frac{6}{6}$; *canines,* $\frac{2}{2}$; *cheek teeth,* $\frac{8 \cdot 10}{10} = 34 - 36$.

Obs. This family embraces the animals formerly included in the old linnean genus Mustela, and familiarly known in this country under the names of Mink, Skunk, Weasel and Marten. They have been distributed by Cuvier into four, and by later writers into fifteen genera, including nearly sixty species distributed over the globe. In this State, we have the types of three genera: Mephitis, Mustela and Putorius.

GENUS MEPHITIS. *Cuvier.*

Head small, with a blunt muzzle and slight arched facial outline. Fur coarse and shaggy. Tail bushy. Fore feet robust, with five long stout claws. Incisors, $\frac{6}{6}$; *canines,* $\frac{2}{2}$; *cheek teeth,* $\frac{6}{6} = 32$. *Nocturnal. Burrowing. Peculiar to America.*

Obs. Were we to place reliance upon figures and descriptions, we might enumerate nineteen species; all of which are, however, considered mere varieties.

THE SKUNK.

MEPHITIS AMERICANA.

PLATE XII. FIG. 1.—(STATE COLLECTION.)

Viverra mephitis. LIN. GMEL.
Striated Weasel, and *Skunk.* PENN. Arct. Zool. Vol. 1, p. 83 and 85.
Stifling Weasel. LOSKIEL, p. 85.
Mustela americana. DESMAREST, Mamm. p. 186.
Mephitis id. SABINE, Frank. Jour. p. 653. HARLAN, Fauna, p. 70.
M. id. GODMAN, Am. Nat. Hist. Vol. 1, p. 213, figure.
M. id. var. *hudsonica.* RICHARDSON, F. B. A. Vol. 1, p. 55.

Characteristics. Black or brownish black, with an irregular whitish patch or stripe over the shoulders. Many varieties in its white marks. Length about two feet.

Description. Head small, when compared to the mass of the body; arched on its facial outline. Snout obtuse. Eyes small and black. Ears small, broad and rounded. Feet broad, and covered with hair, concealing the strong and white claws; those on the anterior extremities very robust and curved. Canines strong and conical. The great carnivorous molar above, with a large internal tubercle. Trunk of the tail of a moderate length, about half the length of the head and body.

Color. The variations in its markings are so great, that it is almost impossible to construct a specific phrase, applicable to the greatest number of these varieties. The specimen in the State Collection, which is remarkable for its size and the beauty of its fur, presents the following appearances: Deep jet black over the whole body and tail, with the exceptions to be noted. A narrow longitudinal white streak, rather more than an inch in length, commences between the eyes, and extends to the nape. Somewhat posterior to this, is a broad patch of a light cream-color, commencing abruptly, dilated on the sides of the neck, then narrowing on the shoulders where it bifurcates. It terminates dilated on the side, where the base of the hair appears tinted with flesh-color; a few straggling white hairs on the rump. Tail with white hairs, but black throughout so much of outer ends as to assume that color, except where they are entirely white and quite long. Total length, 30·0; tail (vertebræ), 9·0; tips of hairs, 13·0.

This well known and thoroughly detested animal is supposed to exist throughout the whole American continent, from the frozen regions of the north, to Paraguay and Chili. The peculiar organs of defence with which it is provided, render it highly interesting. These fetid and detestable discharges do not proceed from the bladder; nor is it distributed over its enemies by its tail, as is generally supposed. It proceeds from two anal glands, which open by ducts into the rectum, and is ejected by muscular exertion at the will of the animal; the tail being elevated at the same time, in order to prevent its coming into contact with this yellow fluid, which must be as disgusting to itself as it is deadly nauseating to its enemies. It is stated by Godman, that this fetid discharge was perceived at night to be luminous. Fortunately for the comfort of his neighbors, he appears to be a peaceful animal, and never emits his potent odors unless attacked by an animal larger than himself. Some idea of the subtle and far pervading influence of this fetor may be conceived from a fact by Dr. Wiley of Block Island, in the Medical Repository: He has distinctly perceived the smell of a skunk, although the nearest land was twenty miles distant. It is nocturnal in its habits, and is often seen sporting about on a bright moonlight night. He is a good burrower, and for this purpose his fore feet and claws are well adapted. I have seen some of their burrows running horizontally twelve to fifteen feet under ground, at about two feet below the surface. The flesh, when carefully prepared, is very sweet; but from the general repugnance to its unsavory habits, it is only eaten by the curious or the indigent. A person in my neighborhood took nineteen from one burrow, and salted them for family use during the winter. It produces from six to ten at a litter. It feeds on birds and their eggs, on frogs, and on field mice and other small quadrupeds. He is regarded as a fit subject for extermination, on account of the havoc which he causes in the poultry-house and barn-yard. His fur is coarse, and of no value as an article of commerce.

GENUS MUSTELA. *Cuvier.*

Head small, oval. Fur exceedingly fine. Tail usually long and cylindrical. One additional molar above and below.

THE FISHER.

MUSTELA CANADENSIS.

PLATE XIII. FIG. 1. SKULL.—(CABINET OF THE LYCEUM.)

Mustela canadensis. LIN. GMEL. Vol. 1, p. 95.
The Fisher. PENN. Arct. Zool. Vol. 1, p. 82.
M. pennanti. ERXLEBEN, System, p. 470.
M. canadensis. HARLAN, Faun. Am. p. 65.
Pennant's Marten. GODMAN, Am. Nat. Hist. Vol. 1, p. 203.
Pekan or *Fisher.* RICHARDSON, F. B. A. Vol. 1, p. 52.
Pekan or *Fisher Weasel.* EMMONS, Mass. Report, 1838, p. 24; of 1840, p. 38.
Black Cat of the New-York hunters.

Characteristics. Greyish over the head and anterior parts of the body; dark brown or black behind. Tail bushy. The largest of the genus.

Description. Form of the body typical. Head broad; nose acute. Ears about three inches from the nose, broad, rounded and distant. Canines long, more particularly those of the upper jaw; penultimate molar with a process on its inner anterior margin. Fore feet shorter than hind feet, robust, and covered with long hair. Soles of the feet thickly covered with short hair. Toes connected partially by a short hairy web; the nails sharp, strong, and incurved. Tail moderately long, bushy and acuminated at the tip, the hairs reaching two and a half to three inches beyond the vertebræ. Fur long, fine and lustrous, increasing in length on the posterior parts of the animal; it consists of two kinds, a short brown down, and longer and more rigid hairs; longer and blacker in winter than in summer.

Color. The markings are somewhat irregular; and there is a variety which, with the exception of the nose and feet, is entirely white. The general and more usual distribution of the colors is noted in the specific phrase. The long rigid hairs are brown at the base, and greyish towards the tips. This greyish color predominates so much on the head, neck, shoulders, upper and anterior portions of the body, as to give to those parts a hoary appearance. Towards the posterior part of the body, and including the tail, the color deepens into a dark brown or jet black. Throat, legs and belly blackish brown, with occasionally a small white spot on its throat, and a trace of another on the belly, sometimes unspotted beneath. Chin and nose brown. Ears margined with yellowish white. It is said to be lighter in winter than in summer. Length of head and body, 24·0; of tail (vertebræ), 11·0.

The Fisher or Black Cat of our hunters, is a large and powerful animal, standing nearly a foot from the ground. It was formerly very abundant in this State, but is now confined to

thinly settled northern districts. Twenty years ago, they were numerous in the western part of the State, where they are now scarcely ever seen. It is a nocturnal species, and lives chiefly on the smaller quadrupeds, but also devours frogs, fish and serpents. It climbs trees with great ease, and takes up its abode in the trunk of a tree. It appears to prefer marshy wooded swamps, and the vicinity of lakes and water courses.

The name of *Fisher*, which has been censured as not applicable to this animal, is, however, that by which it is best known, and which it has received from its characteristic habits. Richardson states that it feeds on the hoards of frozen fish stored up by the residents. We are informed by a person who resided many years near Lake Oneida, where the Fisher was then common, that the name was derived from its singular fondness for the fish used to bait traps. The hunters were in the practice of soaking their fish over night, and it was frequently carried off by the fisher, whose well known tracks were seen in the vicinity. In Hamilton county it is still numerous and troublesome. The hunters there have assured me that they have known a fisher to destroy twelve out of thirteen traps in a line of not more than fourteen miles in length. It brings forth two young annually. The hunting season for the fisher in the northern part of the State, commences about the tenth of October, and lasts to the middle of May, when the furs are not so valuable. The ordinary price is $1·50 per skin; but it is not so fine, nor so highly valued as that of the sable. Its geographical range is included between the fortieth and seventieth parallels of latitude, extending across the continent.

THE AMERICAN SABLE.

MUSTELA MARTES.

PLATE XI. FIG. 2.—PLATE XIX. FIG. 2. SKULL.—(CABINET OF THE LYCEUM.)

Mustela martes. LIN. GMEL. Vol. 1, p. 95.
Pine Marten. PENN. Arct. Zool. Vol. 1, p. 76. HARLAN, Fauna, p. 67. GODMAN, Vol. 1, p. 200, figure. RICHARDSON, F. B. A. Vol. 1, p. 51, (summer dress.)
M. zibbellina? GODMAN, Vol. 1, p. 208.
M. huro. FRED. CUVIER.
Pine Marten. EMMONS, Mass. Report, 1838, p. 25.
The Sable of the New-York hunters.

Characteristics. Varying in color from tawny to brown or black. Head constantly lighter. Length 20 – 30 inches.

Description. Head long and pointed. Stands rather high on its feet. Ears broad, short, and somewhat acuminated. Eyes small and black. Tail bushy, and enlarged towards the end. Toes with long, slender and compressed nails, nearly concealed by the hair.

Color, various, according to age, season and latitude. The following notes are derived from four specimens in the Cabinet of the Lyceum:

No. 1 is larger and higher colored than the others, measuring thirty inches in its total length. Head, sides of the neck and upper part of the throat white. Chin with a slight

tinge of brown. Ears margined with white. Reddish brown behind the ears. The inside of the legs, inferior and posterior parts of the feet, and the palms, dark brown. Tail ten and a half inches long, the tip of the hairs extending four inches beyond the vertebræ; dark brown at the tip, intermixed with a few white hairs; remainder of the body and tail yellowish white, becoming deeper on the posterior parts of the body. Throughout pale yellow. Claws white. The plate represents this specimen.

No. 2 is smaller, being only twenty-two inches in length. Head, chin and ears entirely white. Feet at the base with an obsolete circle of dusky brown. A dusky indistinct line along the dorsal ridge. Tail dusky for two-thirds of its length from the tip. General color bright orange, more vivid on the flanks and abdomen. Palms light-colored.

No. 3 and 4 resemble each other in the distribution of their colors, but are smaller than the preceding. Head greyish white; brownish behind the ears. General color fulvous, intermixed on the back and abdomen with brown, giving a dark hue to the animal. Legs, feet and tail blackish brown, the latter increasing in intensity towards its tip.

The Sable is a very pretty and active little animal, inhabiting the elevated and wooded districts in the northern parts of the State. It lives entirely in trees, and brings forth six to eight at a litter. It is a nocturnal animal, and excessively carnivorous; feeding on mice, birds' eggs, squirrels, etc. The females are said to be smaller than the males. It has been tamed; but from its petulant character, is never docile. The fur is exceedingly beautiful, and highly esteemed. The hunters assure me, that as you proceed north, the fur becomes darker and more valuable, but this seems rather a peculiarity in certain districts. Those obtained in our State, are more usually of the color noted in the figure, and sell for about $1·25 apiece.

The Sable is exceedingly active, and destroys great quantities of squirrels, the red squirrel only occasionally escaping by its superior agility. It is so prolific, and finds the means of living with so much ease, that it would long since have multiplied to a great extent, were it not hunted so perseveringly for its fur. The hunting season for the sable in this State begins about the tenth of October, and ends in the middle of April. The hunters assert, that in the beech-nut season, when they are very abundant, the sable will not touch bait of any kind, believing that at that time it feeds upon these nuts. It is probable, however, that the abundance of nuts attracts great numbers of the smaller quadrupeds, who are thus offered an easy prey to the sable.

A line of traps for these animals, technically called "a sable line," sometimes extends sixty or seventy miles, containing six to ten traps in a mile, according to the nature of the ground. The construction of these traps is exceedingly simple. The hunter cuts off long chips from the nearest tree, and drives them into the ground, forming three sides of a square about six inches across; the top is covered with spruce boughs. The bait, which is either a bit of venison, mice, red squirrel, or any other small animal, is put on the end of a round stick and placed within the trap, resting on a round stick lying on the ground across the open end; on this rests a short upright stick, supporting a heavy log or small tree. Any disturbance of the bait causes the log to fall and crush the animal. These traps are visited once a

fortnight, and oftener if practicable. The fisher and wolvrene, as we have before remarked, will often destroy these traps, by breaking into them behind, and eat up not only the bait, but the captured animal.

I am inclined to believe that the American Sable is very distinct from the Pine Marten of Europe, with which it is usually arranged; but as I have had no means of making a direct comparison, I shall adhere to the ancient name. Its geographical range extends from the Atlantic to the Pacific, and it is found in all the dry wooded districts between the fortieth and sixty-eighth parallels of north latitude.

THE SMALL WEASEL.

MUSTELA PUSILLA.

PLATE XIV. FIG. 1.—(ALBANY MUSEUM.)

Mustela (Putorius) vulgaris. RICHARDSON, (excl. syn.) Fauna Bor. Am. Vol. 1, p. 45.
P. vulgaris. EMMONS, Mass. Report, 1840, p. 44.

Characteristics. Color same as that of *P. noveboracensis* in its summer coat, but smaller; unchanging. Tail one-fourth of the whole length. Length 12 – 13 inches.

Description. Body vermiform; head somewhat obtusely pointed. Ears broad, wide, and slightly pointed above. Eyes black and prominent. A series of dark brownish whiskers along the upper lips, and another, consisting of five or six, parallel with it above; a small patch of two or three above the eye. Fore feet short, and rather robust; claws acute, curved, and almost entirely concealed by the long hairs. Tail short, cylindrical, even throughout, not bushy; the tips of hairs extending beyond the vertebræ. Teeth of the typical number; above, the two outer incisors largest, the intermediate ones equal; beneath, they are crowded, with the two external largest, the two intermediate small, and the remaining two behind and somewhat between the external and medial incisors. In the upper jaw, the second jaw tooth is small and distant, the posterior with a large spur directed inwards.

Color. Uniform throughout the year; more glossy, but paler than in the New-York weasel. Upper part of the head, neck and body, of a light reddish brown; the same color prevails on the outer and anterior part of the fore legs, the whole of the head, legs, rump and tail. The chin, a small spot above the angle of the jaw extending to the borders of the upper lip, throat, belly and breast, white. On the throat this color extends to the sides of the neck, appears on the posterior parts of the fore legs, becomes dilated on the anterior part of the abdomen, then irregularly contracted, and subsequently throwing off an acute-angled patch of the same color on the upper and external part of the thighs. Tail a shade darker at the tip.

Total length, ...	10·8.	Tail (vertebræ), ...	1·8.
Head and neck, ...	2·8.	Ditto, including fur, ...	2·1.
Body, ...	6·0.		

We suppose this to be the Common Weasel of Richardson, which he states to be identical with the Common Weasel of Europe. It is, however, generically different, and we have been consequently compelled to suggest a distinctive name. Godman, Vol. 1, p. 193, asserts, on the authority of Charles Bonaparte, that the Ermine, in its summer coat, has been usually considered by naturalists as the *M. vulgaris* of Europe. This is a mistake : it is the present species which has thus been confounded.

It is by no means a rare animal, but is difficult to capture, and is usually known under the name of the *Little Weasel*. It feeds on mice, insects, young birds, eggs, etc., and possesses all the voracity characteristic of the tribe.

THE BROWN WEASEL.

MUSTELA FUSCA.

Mustela fusca. BACHMAN, Proceed. Ac. Sc. 1841, p. 94.

Characteristics. Brown above; pure white beneath. Tail one-fifth of the whole length. Feet with long hairs. Length, 12·0.

Description. Form as in the preceding, but more robust. Feet remarkably robust, and densely covered with long hairs, which almost conceal the nails. Ears broad and rounded. Tail with no enlarged tuft at the end.

Color. Dark fawn above, becoming deeper on the posterior part of the back; the tip of the tail still darker. Beneath, pure white, from the chin extending around the mouth, throat, belly, and interior of the extremities.

Head and body,	9·1.
Tail (vertebræ),	2·8.
Tail, including hairs,	3·2.

In the State Collection is a specimen of this animal, upon which I made, in 1840, two years since, the following note : "Taken in May, in Suffolk county; differs from *pusilla* in its legs, "which are very robust, and covered with long hair. It resembles *noveboracensis* in its "markings; allied to *vulgaris* of Richardson, (excl. syn.), but his species has slender feet. "We wait for more extended opportunities of comparison, before considering it a new "species."

Recently, Bachman, (Op. cit.) has given this a careful examination, and distinguished it as a new species. We adopt his name.

(*EXTRA-LIMITAL.*)

M. frenata, Lichtenstein. (BACHM. Proc. Ac. Sc.) Light fawn above, yellowish beneath; ears and nose dark brown; a white spot on the head, and a band above the eyes. Whole length 18 inches; tail 6·5. *California.*

GENUS PUTORIUS. *Cuvier.*

Form and habits of the preceding. Head sub-globose. Muzzle short and blunt. Body highly vermiform. Neck very long. Tail long, cylindrical, not bushy. Cheek teeth $\frac{3}{4}\frac{3}{5}$. *All with a musky odor. Nocturnal.*

THE NEW-YORK ERMINE.

PUTORIUS NOVEBORACENSIS.

PLATE XII. FIG. 2, WINTER DRESS. — PLATE XIV. FIG. 2, SUMMER DRESS. — (STATE COLLECTION.)

Stoat Weasel. PENN. Arct. Zool. Vol. 1, p. 75.
Mustela erminea. HARLAN, Fauna Am. p. 62.
The Ermine Weasel. GODMAN, Am. Nat. Hist. Vol. 1, p. 193, fig. 1, winter dress. ID. ib. Vol. 1, p. 693, pl. fig. 2, summer dress.
Putorius noveboracensis. Report N. Y. Survey, 1840, p. 18. EMMONS, Mass. Report, 1840, p. 45.

Characteristics. Summer, reddish brown above, yellowish beneath; winter, white. Tip of the tail black. Length 16 – 24 inches.

Description. Neck and body long and slender. Forehead convex. Whiskers numerous, a few extending as far as the ears. Eyes small, black and lively, 0·7 distant from the nose. Ears low, broad and rounded, 0·5 high, not entirely surrounding the auditory canal, which is covered with long hair; on the margin, the hairs are sparse and short. Legs short, robust, five-toed, the inner much the shortest. In winter, the sharp curved claws and the soles covered with hair. Six abdominal and ventral teats. Fur short and soft, somewhat coarser and longer on the hairy tail, which is bushy at the end. Teeth thirty-four, as in *P. vison.*

Color. In summer the head, neck and body chesnut brown above, darker behind, and increasing in intensity along the tail to the tip. This brown color extends along the flanks, and the external parts of the extremities. Chin whitish, passing into yellowish white. A whitish stripe commencing at the chin, expanding a little on the throat towards the ears, broader over the breast, covering the interior and upper part of the fore legs, preserves nearly the same breadth along the belly, and terminates on the upper and inner part of the thighs. This color is separated along its course from the brown above by a well defined irregular line, which is occasionally dark brown. This is the ordinary state of the fur during summer, which it often retains late in autumn, and, as I have reason to believe, often through the winter. My friend Mr. Linsley has a specimen, which is "entirely rufous black, with two white spots "under the throat; lower jaw white from the point to the rictus." In its complete winter coat, it is pure white along the back, light sulphur yellow along the sides and beneath, including the legs. Tail jet black at the tip.

Length of head, ... 2·0.	Tail (vertebræ), ... 4·0.
Length of neck,..... 2·0.	Ditto, including fur,. 5·1.
Length of body, ... 6·5.	

These are, however, not the largest dimensions. I have seen one from Dutchess county, and another from Rockland county, measuring sixteen and a half inches; and my friend Mr. Linsley states, that he has one measuring twenty and a half inches.

The habits of this animal, as the ruthless destroyer of poultry, are well known; but these injuries, which are obvious and potent, are, we think, more than counterbalanced by their destruction of hordes of mice which congregate in barns and in stacks of grain exposed in the fields. Upon one occasion, we remember to have seen an example of fifty or sixty mice, whose lacerated remains bore testimony to the valuable services of this species.

I have never seen the true Ermine in its summer dress, and only know it from Pennant's description (Arct. Zool. Vol. 1, p. 75): "Ears edged with white; head, back, side and legs, "pale tawny brown; under side of body white; lower part of tail brown, end black."

Our animal is exceedingly active, nocturnal in its habits, and hiding under piles of wood or stone. We do not know whether it makes a burrow. Its geographical limits as yet are not settled. We suppose it to be a northern animal, found as far south as Pennsylvania. In its white coat, it is called, in some parts of the State, the *Catamingo*, and the *White Weasel*.

THE MINK.

PUTORIUS VISON.

PLATE XI. FIG. 1.—PLATE VIII. FIG. 3, A, B. SKULL.—(STATE COLLECTION.)

Mustela vison. LIN. GMEL. Vol. 1, p. 94.
Mink Otter. PENN. Arct. Zool. Vol. 1, p. 87.
Vison. ID. ib. p. 73.
M. vison. HARLAN, Fauna Am. p. 65.
M. lutreola. GODMAN, Am. Nat. Hist. Vol. 1, p. 206.
M. (Putorius) vison. RICHARDSON, F. B. A. Vol. 1, p. 48.

Characteristics. Tawny. Chin white or yellowish white. Ears short, and mostly concealed in the fur. Tail half as long as head and body. Length 20·0 – 25·0.

Description. Body long and slender. Head small and rounded. Ears broad and low, with the auricular opening very large; they are nearly hidden by the fur. Eyes small. Whiskers stiff, shorter than the head. Muzzle thick, and somewhat depressed. Neck very long. Legs short in proportion to the bulk of the animal. Claws short, slightly curved, blackish at the base, horn-colored at the tips, and nearly concealed by long subrigid hairs. Toes webbed, with short hairs on the webs above and below. Tail thick at the base, cylindrical, slender, gradually tapering to the tip. The fur shortest on the head, longer behind, and is of two kinds; a soft light grey down, covered by longer lustrous hairs. Two fetid glands near the

insertion of the tail. Six teats, ventral. Teeth 34. Above, the four intermediate incisors are alike, and subequal; the exterior larger, channelled on the outside, and somewhat enlarged at the base. Upper canines larger and longer than those below, and in their reciprocal position exterior to, and reaching below the sockets of the lower canines, with no tubercle to their bases. First cheek tooth above smallest, with a sharp point, and a broad shoulder directed outwards, with two fangs; the second larger, with a single point, and two equal shoulders; the third largest, with three points in a line, the middle largest and the anterior smallest, with a fourth on an internal space: this tooth is emarginate in front, almost receiving the posterior shoulder of the preceding tooth. The last cheek tooth wider than long, with two elevations externally circumscribed by a raised margin; its internal projection has one blunt point, likewise surrounded by a raised margin. In the lower jaw, the incisors are smaller than those above, the two medial smallest and subequal; the first cheek tooth very small, elevated in front, with a slight ridge dividing the shoulder behind; the next larger, with its posterior shoulder lower than that in front; the succeeding one tricuspid, triangular, with its shoulders equal; penultimate tooth largest, tricuspid, its posterior point truncate with a sharp ridge; the last smallest, with a central depression, and a raised margin which is highest on the outside.

Color. Nearly uniform, reddish brown or tawny above, slightly paler beneath. Chin, and frequently a small spot on the throat, and occasionally one or two smaller spots between the fore legs, white. Posterior portion of the tail blackish, frequently intensely black at the tip.

Head and body,	14·0.	Height at meatus,	0·9.
Tail (vertebræ),	7·0.	Greatest diameter behind meatus,	1·1.
Ditto (tips of fur),	8·0.	Extent over zygomatic arches,	1·3.
Length of skull,	2·3.	Skull in the same line,	0·5.

The Mink is a well known animal in every part of the State. Its popular name is corrupted from *mœnk*, given to it by our early Swedish colonists. It lives almost exclusively near ponds and water courses, feeding on fish, fresh-water shells, aquatic reptiles, and the eggs of tortoises. In their habits they are closely allied to the Otter; so much so, that Pennant arranged it under that genus, and in his History of Quadrupeds calls it the Lesser Otter. It swims and dives with great facility, and can remain a long time under water. It has a strong disagreeable odor, which, according to Prof. Emmons, is that of the skunk and cat combined. Occasionally it invades the poultry yard, and causes great havoc. It feeds also upon field mice, and other small quadrupeds. It is said to be capable of domestication. The hunters in the north of the State have described to me two varieties of the Mink: One they call *Mountain Mink*, which is small and black; the other, which they call the *Water Mink*, is much larger, and of a chesnut red. From their dissimilar habits, I should be inclined to suspect the first to be a distinct and hitherto undescribed species.

FAMILY V. LUTRIDÆ.

Embraces the Otters, which are amphibious, with broad palmate feet. Tail enlarged at the base, and more or less horizontally flattened. Piscivorous; valuable for their fur. Comprises two genera.

GENUS LUTRA. *Ray, Cuvier.*

Head broad and rounded, terminating in a blunt muzzle. Ears very short. Body robust. Legs short. Toes five before, and the rudiment of a fifth behind, connected by a membrane, and armed with short not retractile claws. A fetid gland on each side of the vent, containing fetid matter. Good swimmers; live along banks of streams. Incisors, $\frac{6}{6}$; *canines,* $\frac{2}{2}$; *cheek teeth,* $\frac{1}{1}\frac{0}{0} = 36$.

Obs. In the latest systems, nine species are enumerated, of which three are from America. The existence of more than one species in America is, however, as yet not clearly established.

THE NORTH AMERICAN OTTER.

LUTRA CANADENSIS.

PLATE III. FIG. 1.—PLATE XXXIII. FIG. 1, 2, 3. VIEWS OF THE SKULL.

Common Otter. PENNANT, Arct. Zool. Vol. 1, p. 86.
Land Otter. WARDEN, Hist. U. S. Vol. 1, p. 206.
Lutra canadensis. SABINE, Franklin's Jour. p. 653.
L. braziliensis. HARLAN, Faun. p. 72. GODMAN, Vol. 1, p. 57, pl. fig. 2.
L. canadensis. RICHARDSON, F. B. A. Vol. 1, p. 57. (Large Northern Var.)
Canadian Otter. GRIFFITH, Cuv. R. An. Vol. 2, p. 316, figure.
American Otter. EMMONS, Mass. Report, 1838, p. 25; 1840, p. 46.

Characteristics. Glossy brown. Chin and throat dusky white. Tail shorter than the body. Length three and a half to five feet.

Description. Head globular, but not as much as in the European species. Lips thick and fleshy. Ears short and rounded. Eyes small for the size of the animal, and near together. Whiskers remarkably rigid. Body long, cylindrical. Tail slightly depressed at the base, nearly one-fourth of the total length; at the base of the tail, two oval glands. Fur fine and dense, intermixed with coarser hairs. In their dentition, the Otters are eminently characterized by the enormous dilatation of the two posterior cheek teeth in the upper jaw. Our species, in this particular, offers some variations from the European Otter. The penultimate jaw tooth, in one species, has a broad internal heel directed obliquely forward, with a deep fissure dividing the surface into two rounded and elevated portions; and the pointed tubercle is broad, with a high shoulder posteriorly, and comparatively little elevated. The last tubercular tooth

subquadrate, nearly as large as the preceding, and its greatest axis directed obliquely backwards, with four or rather six distinct elevated points; but the outer raised margin, which is so conspicuous in the European Otter, appears to be indistinct, or simply elevated into two pointed tubercles, or wanting entirely, in the American. With age the anterior jaw teeth become effaced. In a very aged specimen which we have placed in the State Collection, the two anterior jaw teeth on each side (false molars) have disappeared, and even the canines are worn down to the sockets. Length of this skull, 4·1; height at meatus, 1·7; transverse diameter at meatus, 2·2; distance across the zygomatic arches, 2·9; narrowest diameter, 0·8.

Color. This varies with the season to a slight extent, but is usually of a dark glossy brown, and white or light-colored about the face and throat. In summer, nearly black, lighter beneath. Tail darkest towards the tip.

Head and body, ...	39·0 – 48·0.
Tail, ...	14·0 – 18·0.

The females are smaller than the males.

The American Otter, once so numerous in every part of the State, is now exceedingly scarce. In the counties of Kings, Queens, Suffolk and Richmond, it is now extirpated. In the northern districts, it is yet sufficiently numerous to become an object of pursuit. The hunting season for the otter commences there about the twentieth of September, and continues until the middle of May, and its fur ranks in value next to that of the beaver: a good skin is worth eight dollars. They are used by hatters for the finer sort of hats, and are also converted into costly caps.

The Otter is a sagacious, wary animal, selecting low swampy grounds near a pond or running stream for its abode. He makes an excavation in the bank, which opens under water, and a small breathing hole to the surface of the ground. Like the Beaver, he is too sagacious to be caught by any bait in a trap; and accordingly, the steel trap is placed in the water beneath the exit from their burrow, or at the bottom of one of their *slides*. These *otter slides*, as they are termed, form one of the most interesting peculiarities in the history of the animal, and almost approach the fabulous. In winter, they select a high bank of snow, and amuse themselves for hours in sliding down, head foremost. In summer, they choose a steep bank by the side of a stream, which terminates in deep water, and indulge there in the same recreation. I have never seen the animal thus employed, but it is universally believed among hunters; and I saw, in the uninhabited northern districts of the State, many of the places which had been used as slides, and which pointed out to the keen eye of the hunter a sure sign of numerous otters in the vicinity.

The Otter is capable of being domesticated, and lives principally on fish and other aquatic animals. They live in small families, like the Beaver. They have two young at a litter, about the middle or latter end of March, but the period of gestation is unknown. The secretion from their anal glands is used as a bait.

The Canadian Otter, as described by Richardson, appears to be a large variety, with a uniformly colored fur above and beneath. The figure given by Griffith represents it with a white nose, chin and abdomen. I have carefully compared the skull of the southern species *lataxina*, with the New-York Otter, and can find no essential nor even trivial difference. If, then, as I apprehend, the species described by Richardson, and the *lataxina*, are identical with the one above described, this Otter is found from the Atlantic to the Pacific, and from the Gulf of Mexico to the shores of the Arctic sea.

(*EXTRA-LIMITAL*)

L. lataxina. (Fred. Cuv. Dic. Sc. Nat. Vol. 27, p. 243.) Deep blackish brown, paler beneath; the long coarse hair uniform brown black; the fine down brownish above, greyish on sides of the head and under side of neck. *Carolina, Kentucky.*

Genus Enhydra, *Fleming.* Embraces the Sea Otter, and characterized by having six incisors above, and but four beneath. Cheek teeth, $\frac{1\,2}{1\,6} = 38$. Body very long; legs and tail very short.

E. lutris. Sea Otter. (Griff. Cuv. Vol. 2, p. 316, fig.) Chesnut brown or black; twice the size of the common otter; fur exceedingly fine. Total length five feet; tail ten inches. *North Pacific Coast.*

FAMILY VI. CANIDÆ.

Muzzle elongated, naked, glandular. Ears moderately large, and in most of the domesticated species pendent. Tongue smooth and soft. Tail for the most part bushy. Fore feet with five, and hind feet with four not retractile claws. Cheek teeth twelve above, and fourteen below.

Obs. In this family, we propose to include the Dog, Fox and Wolf, which are extremely difficult to separate by positive characters. The former is known only in a domesticated state.

GENUS CANIS.

Tail recurved. Pupil of the eye circular. Vary indefinitely in form, size and color, the result of domestication.

THE DOMESTIC DOG.

Canis familiaris.

Upwards of thirty varieties or races have been enumerated by systematic writers, nearly all of which have been introduced into this country. Of those peculiar to North America, we find,

Var. a, *borealis.* (Esquimaux Dog.) Fur long, thick and woolly beneath; top of the head and back black; nose, cheeks, belly and legs white; ears short, erect.

Var. b, *lagopus*. White, with patches of blackish grey; ears pointed, erect; foot broad and hairy; tail bushy.

Var. c, *terræ-novæ*. (Newfoundland Dog.) Head broad; nose blunt; ears long, soft and pendulous. Of this there appears to be two distinct races: One has the breast, posterior part of the thighs and tail with long waved hair, the rest of the body with smooth and compressed hair; the other variety is entirely covered with long waved silken hair.

Var. d, *canadensis*. Black and grey, mixed with white; ears erect, long, shaggy.

Var. e, *novæ-caledoniæ*. Spotted; body long; legs short, straight; ears erect.

The most conspicuous among the imported varieties are, the *danicus*, or Spotted Carriage Dog; *graius*, or Greyhound, of which there are several races; *extrarius*, or Spaniel; *aquaticus*, or Curly Poodle; *avicularius*, or Pointer; *molossus*, or Bulldog; *sagax*, or Hound, &c. In this State, our hunting dogs are almost exclusively derived from England. The breed used for deer is the Fox-hound, and frequently a mixed breed between the Harrier and Staghound.

GENUS LUPUS.

Eyes oblique. Tail straight. Pupil of the eye circular.

THE COMMON AMERICAN WOLF.

Lupus occidentalis.

PLATE XXVII. FIG. 2.

Canis lupus. Harlan, Fauna, p. 81.
The Common Wolf. Godman, Am. Nat. Hist. Vol. 1, p. 255, fig. 1
C. (*Lupus*) *occidentalis*. Richardson, F. B. A. Vol. 1, p. 60.
C. lupus. Emmons, Mass. Report, 1838, p. 26; 1840, p. 28.

Characteristics. Color various from white to black, usually greyish. Space between the ears greater than their height. Feet broad. Neck and tail with bushy hair.

Description. Compared with the European species, the body is more robust, and the legs shorter; the muzzle thicker and more obtuse. Ears erect and conical.

Color. In this State, the prevailing color is dark grey, mixed with reddish; darker along the back; shorter in summer. Frequently whitish about the ears, throat and breast. Exterior of the ears and legs with a reddish tinge. Anterior part of fore legs blackish. Tail varied with white, black and ferruginous.

Length of head and body, ...	36·0 – 48·0.
Tail, ...	10·0 – 12·0.

Prof. Emmons gives the total length from a specimen in his possession, 60·3.

The American Wolf, hitherto confounded by our systematic writers with the European, offers many varieties, which, as in dogs, seem to affect particular localities. In this State we have two varieties.

VAR. a. *Grey Wolf.* White or greyish white in winter; in summer it has short reddish hairs. This is the most common kind.

VAR. b. *Black Wolf.* Entirely black, more bulky and powerful than the preceding. Very rare.

The Wolf, in this State, confines its depredations chiefly to deer and other animals. In some of the southern counties, where they were formerly so numerous as to require legislative enactments, they are now entirely extirpated. Vanderdonck, writing from New-York about the year 1645, says, that one of the principal objections to keeping sheep in the Colony, was the number of wolves. They are still found in the mountainous and wooded parts of the State, and, we believe, are most numerous in St. Lawrence and the adjacent counties. We have been assured by intelligent hunters, that their ravages among deer are so great that they destroy five to one killed by man. They follow deer either singly, or in packs of eight or ten, with all the ardor of a pack of hounds, and with a prolonged howl. They usually select a young or injured deer, and trust more to tire him down, than to overtake him by superior speed. In the summer, their prey easily escapes by taking to the water; but in winter, the same instinct leads to his immediate capture, for on the ice the wolf quickly overtakes him. Towards spring, there is scarcely a lake in the north of the State that has not numerous carcases of deer on its frozen surface. In most of the counties, bounties varying from ten to twenty dollars per head are offered for the wolf, paid partly by the State, and partly by the county and the township.

Our wolf is equally voracious and cowardly, flying before man. I have, however, known them, when satiating their hunger over the carcase of a deer, to snarl and snap at the approach of a man, and only to leave their prey reluctantly when he arrived almost within striking distance.

(*EXTRA-LIMITAL*)

VAR. a. *Dusky Wolf.* (SAY, Long's Exped. Vol. 1, p. 333. RICHARDSON, pl. 3.) *Northern and Western Regions.*

VAR. b. *Pied Wolf.* (RICHARDSON, Vol. 1, p. 68.) *Arctic Regions.*

VAR. c. *White Wolf.* (LEWIS AND CLARK, Vol. 1, p. 107.) *Arctic and Western Regions.*

VAR. d. *Florida Wolf.* (BARTRAM, p. 199.)

VAR. e. *Yellow Wolf.* (LEWIS & CLARK, Vol. 1, p. 40.) *Missouri.*

VAR. f. *Prairie Wolf.* (SAY, Long's Exped. Vol. 1, p. 27 and 162.) *Missouri.*

GENUS VULPES.

Nose pointed. Head more triangular than in the preceding. Pupils linear. Eyes oblique. Upper incisors nearly vertical. Tail long, bushy and cylindrical, without pendulous hairs. Have a fetid odor, and burrow in the earth. Nocturnal. Smaller and more numerous than the preceding.

THE RED FOX.

VULPES FULVUS.

PLATE VII. FIG. 1.—(STATE COLLECTION.)

Red Fox. LEWIS & CLARK, Vol. 2, p. 159.
Canis fulvus. DESM. Mammalogie, p. 203.
Red Fox. SABINE, App. Frankl. Journey, p. 656.
C. vulpes? and *C. fulvus.* HARLAN, Fauna, p. 86 and 89.
The Red Fox. GODMAN, Am. Nat. Hist. Vol. 1, p. 276.
American Fox. RICHARDSON, F. B. A. Vol. 1, p. 91, pl. 6.
Canis (Vulpes vulgaris) vulpes? The Fox. ID. ib. p. 97.
Cross Fox. ID. ib. p. 93, (Variety.)
The Red Fox. EMMONS, Mass. Report, 1840, p. 30.

Characteristics. Reddish above, whitish beneath. Ears behind, and anterior part of legs varying from light brown to deep black. Length 3 – 4 feet.

VAR. a, *decussatus*, with black stripes across the neck and shoulders.

VAR. b, *argentatus*, black entirely.

Description, (from a large male killed in Queens county, January.) Snout small and pointed. Length of head, 7·0.

Color. Anterior part of the head, the flanks and back, bright reddish, more particularly along the back and foreshoulders, where the color is more intense. Margin of the upper jaw and chin, pure white. Throat, breast, and a narrow space along the belly, whitish, mixed with brown on the latter. Fore and hind feet black in front, the black on the latter extending up on the outside of the thigh. Toes margined with fulvous. Brush ample, reddish, composed of two sorts of hairs; the one, black at the base and reddish at the tips; the other, much longer, entirely black, and giving to the whole tail a dusky appearance.

Head and body,	29·0.
Tail (vertebræ),	12·0.
Ditto, tips of hairs,	16·0.

The Red Fox varies considerably in weight and size; the specimen above described weighed eleven pounds, and I have heard of others weighing fifteen pounds, but such are not common: the more usual weight is from eight to ten pounds. Although this fox burrows well, yet it is not uncommon to find them taking possession of the burrows of the skunk, for the purpose

of rearing their young. Richardson states that it burrows in summer, and in winter takes refuge under a fallen tree. It brings forth four to six young, about the latter end of March or first of April, in my neighborhood: these are at first covered with a smoke-brown fur. In a litter which I once saw, the tips of the tail in all were white, and like the dog, were blind for some days after birth. They feed on the smaller quadrupeds and birds, and are accused of destroying lambs. They make occasional forays upon the barnyard, but in this respect they are not so daring as the other species, and perhaps in some measure compensate for these injuries by destroying field mice and other noxious vermin. Its flesh is rank and disagreeable. It is to this species we refer two strongly marked varieties, which have by some naturalists been treated as species.

1. *The Cross Fox.* Color of the preceding, with a dark stripe on the neck from the head to the back, crossed at right angles by another dark stripe over the shoulders. This cross is sometimes only feebly distinct, and at others well defined. It has the size, form, habits and fine fur of the Red Fox, and is always considered by the hunters as a variety. The caprice of fashion has attached a great value to this skin. While the red fox skin is valued at about two dollars, the cross fox has been known to sell for twelve, and sometimes as high as fifteen dollars. It occurs in every part of the State, but more particularly in the northern districts.

2. *The Black Fox.* (GODMAN, Vol. 1, p. 274, pl. fig. 1.) Almost entirely black; the end of the tail and spots on the breast occasionally white, sometimes intensely hoary. This is very rare in this State. I have never met with it; but I have been assured by hunters, in the northern counties, that they have sometimes killed it. Richardson, p. 94, asserts that its fur fetches six times the price of any other fur produced in North America. Its value doubtless increases with the intensity and purity of the black color.

THE GREY FOX.

VULPES VIRGINIANUS.

PLATE VII. FIG. 2.—(STATE COLLECTION.)

The Grey Fox. CATESBY, Car. Vol. 2, p. 78.
Canis virginianus. GMELIN, Syst. Vol. 1, p. 74.
C. cinereo-argentatus. SAY, Long's Exped. Vol. 2, p. 340.
C. virginianus. HARLAN, Fauna Americana, p. 89.
The Grey Fox. GODMAN, Am. Nat. Hist. Vol. 1, p. 280 (figure). EMMONS, Mass. Report, 1840, p. 31.

Characteristics. Grey, varied with fulvous; a patch of black on each side, between the eye and nose. Smaller than the preceding.

Description. The body is lower on its legs, and its muzzle is more acute than in the Red Fox. Tail thick and bushy.

Color, generally hoary or silvery grey, becoming darker from the foreshoulders to the posterior parts. Fur at base lead color, then soiled white, gradually becoming white, and tipped with black. Head grey. Ears yellowish within, tinged with reddish around their bases; tips dark brown, yellowish behind. On each side of the head a sub-triangular patch

between the eyes and nose; near the orbits, this black patch is produced upwards in a narrow line towards the ears. Muzzle black, yellowish on each side for a small space above; sides of the neck tawny; lower jaw black. Breast occasionally spotted with white. Beneath, light colored. Tail of the general hue of the body, slightly tinged with rufous beneath, and occasionally darker at the tip.

Head and body,	18·0 – 25·0.
Tail (vertebræ),	7·0 – 10·0.
Ditto (tip of hairs),	9·0 – 12·0.

This species is more common in the southern counties than farther north. On Long Island it is very abundant, and is there frequently known under the name of the *Plain* or *Grass Fox*. It affords great amusement to hunters, but not for the reasons assigned by Godman; namely, that it is killed generally near the place where it is first started: On the contrary, it usually takes a direct course for many miles, at least on the great plains; and as the ordinary deer-hound is generally employed, I have often known it to escape.

The Grey Fox is bolder and more astute, if possible, than the red one, and more frequently prowls about barn-yards. Very little, however, is known of his habits, beyond his destructive propensities. Catesby asserts that they climb trees with facility. This is probable, for I have witnessed the same fact in the Red Fox, when closely pursued by hounds. The Grey Fox does not extend far beyond 42° north, and its southern limits extend to Florida.

(*EXTRA-LIMITAL.*)

C. velox. Burrowing Fox. (Say, Long's Exped. Vol. 1, p. 486.) Body slender; silvery grey, varied with fulvous. Tail long and blackish. Smallest of the American Foxes. *Missouri.*

FAMILY VII. FELIDÆ.

Head short in proportion to its length, rounded. Muzzle short, obtuse. Claws completely retractile. Exclusively carnivorous. Nocturnal.

Obs. This family, which corresponds nearly with the old linnean genus *Felis*, has been extended, by some modern system-mongers, to include Dogs, Wolves and Foxes. As we understand it, it comprises four or five genera, and about forty species. In this State, we have but three representatives of this family, included under two genera.

GENUS FELIS. *Linneus.*

Ears short and distant, not tufted. No mane. Tail long, varying occasionally in the same species. Tongue roughened with prickles. Claws curved and acute. Cheek teeth eight above, and six below.

Obs. The common imported Domestic Cat belongs to this genus. It is now generally believed to have been derived from the *F. maniculata*, Ruppel, which still exists in a wild state in the northern parts of Africa. Ruppel supposes it to have been first reclaimed by the Egyptians. It is a common opinion that we have, in this country, *wild cats*, which have been derived either from the *domestic cat* resuming its primitive wildness, or by alliance with those already in a wild state. This is a great error. We have no small species, characterized by a long tail, in the country.

THE NORTHERN PANTHER.

Felis concolor.

PLATE IX. FIG. 2. Adult. — PLATE IX. FIG. 1. Young.

Felis concolor. Lin., Gmel. Vol. 1, p. 79.
Cuguar. Loskiel, p. 82.
F. cougar. Temminck, Monog. de Mamm. p. 134.
F. concolor. Harlan, Fauna Am. p. 94.
The Cougar. Godman, Am. Nat. Hist. Vol. 1, p. 291, figure.
F. concolor. Desm. Mammalogie, p. 218.
The Puma, or *American Lion.* Emmons, Mass. Report, 1840, p. 35.

Characteristics. Very large. Uniform tawny, paler beneath. Length 7 – 10 feet. Young, spotted with brown.

Description. Body long, cylindrical, and rather slender. Legs robust, and comparatively short. Ears somewhat rounded. Tail long, slender, cylindrical. Fur soft and short.

Color. Body and legs of a uniform fulvous or tawny hue. I have never observed the spots of a deeper hue, seen only in certain lights, which Temminck ascribes to this species. Ears light-colored within, blackish behind. Belly pale reddish or reddish white. Face sometimes with a uniform lighter tint than the general hue of the body; oftener with the mouth, chin, and internal angle of the eyes white. "Tail of the male longer than the female, dark brown "at the extremity." (*Emmons.*)

Head and body,	53·0 – 84·0.
Tail,	20·0 – 27·0.

Description of a young Panther, not more than a week old, from the Collection of Prof. Emmons. Ears pendulous, furnished with hair within and without, projecting beyond the margins. The whole body covered with a soft dense fur, forming on the sides of the neck an indistinct collar. Claws sharp, curved, not channelled.

Color. The whole body light reddish grey, with oblong irregular blackish brown spots. According to Prof. Emmons, these spots mostly disappear at the first shedding of the hair. Tail with four annulations of the same color, blackish at the tip; beneath, light dusky brown. Outside of the legs irregularly banded with grey and brownish, the latter predominating on the fore legs. Space between the eyes, light brown. Ears black exteriorly, white within. Eyes large and black. A space on the middle portion of the upper lip, together with the whiskers, white. Infra-orbital space and the chin soiled grey.

Head and neck,	4·5.	Height of ears,	0·7.
Body,	8·0.	Ditto at foreshoulders,	4·8.
Tail,	4·8.	Girth round chest,	7·5.

In this specimen, only the four lower incisors were developed.

The difference in the length of the tail in this species is worthy of note; amounting, in individuals of nearly the same size, to several inches. In a specimen alluded to by Godman, the head and body was four feet five inches, and the tail two feet four inches. Prof. Emmons gives a total length to one individual, of nine feet four inches. In a female, the tail was one foot nine inches; and in a male, two feet three inches. Whether this is a constant sexual distinction, is not yet sufficiently determined. The largest individual of which we have any account, is in the Museum at Utica. It was discovered on a small island on Lake Fourth, Herkimer county, and killed by the hunter Wood, just after it had taken to the water. When recently killed, it had a total length of eleven feet three inches.

The *Cougar* or *Painter*, (a corruption of the word *Panther*,) is now rarely seen in the southern parts of the State; though the writer remembers, when a boy, the consternation occasioned by the appearance of one of these animals in Westchester county, not more than twenty-five miles from New-York. In the early settlement of this State, this animal was believed to be a lion; and we find in Vanderdonck's History of the New-Netherlands, the following passage in relation to this subject: "Although the New-Netherlands lie in a fierce "climate, and the country in winter seems rather cold, nevertheless lions are found there, "but not by the christians, who have traversed the land without seeing one. It is only known "to us by the skins of the females, which are sometimes brought in for sale by the natives. "In reply to our inquiries, they say that the lions are found far to the southwest, fifteen to "twenty days journey; that they live in very high mountains, and that the males are too "active and fierce to be taken."

In this State, the Panther is most numerous in the rocky northern districts, and particularly in the counties of Herkimer, Hamilton and St. Lawrence. They are occasionally seen among the Kaaterskill mountains; and the specimen in the New-York Museum, which has served as a basis for many marvellous legends, was obtained from this locality. It appears rarely by daylight, unless hard pressed for food, but usually conceals itself behind fallen trees or rocks until evening. It prefers for its usual retreat, ledges of rocks inaccessible to man, which are known familiarly to the hunters under the name of *panther ledges*. They wander,

however, over large tracts of country in search of their prey, but rarely leave the forests. When followed by dogs, it takes to the nearest tree, and looking down upon its assailants, makes a noise like the purr of a cat, but much louder. The screams attributed to this animal during the night, are supposed by many hunters to proceed from some species of owl. The female brings forth two at a litter. They prey upon deer, and all the smaller quadrupeds, not even refusing the Canada porcupine. Occasionally they take to the water, but swim deeply and badly.

The Panther is an animal of undoubted strength and ferocity; and under certain circumstances, such as are so graphically depicted by our celebrated novelist COOPER, may be induced to take a stand before the hunter. Notwithstanding the various stories of their ferocity and courage, I have never yet met with a well authenticated account of their having attacked a man. In this I am sustained by the testimony of every hunter I have conversed with; they represent them as uniformly cowardly, and retreating as quickly as possible from the face of man. Prof. EMMONS states, that most of the tales relating to its depredations are fictitious; and that in the part of St. Lawrence county where they are most numerous, no instance is known of their having destroyed a single individual, man or child. I was told by a hunter, that upon one occasion, he met with a female panther and two of her cubs. They were quite helpless, and he took them up in his arms, the mother following at some distance, and stopping whenever he stopped, without venturing to attack him. In this way she followed him for two or three miles, when, as he approached a settlement, she finally disappeared. They have been known, however, to approach the *shanty* of the hunter, attracted no doubt by the fire or the smell of victuals; but the smallest movement on the part of the hunter would be the signal for their disappearance. I was told of one in Warren county, that resorted to a barn, from whence he was repeatedly dislodged, and finally killed. He showed no fight whatever. His mouth was found to be filled with the spines of the Canada porcupine, which was probably the cause of his diminished wariness and ferocity, and would in all probability have finally caused his death.

The geographical range of the Cougar, Panther or Catamount, is very extensive. About fifteen years ago, one was shot near Montpelier in Vermont, and a few have been occasionally observed in Massachusetts. Its present northern limits do not probably extend beyond New-York. To the south, its limits are not well defined. It is said to extend through the intertropical regions to Paraguay. It is far from being well established that the northern and southern species are identical.

GENUS LYNCUS. *Gray.*

Ears triangular, more or less tufted. Tail shorter than the head

THE NORTHERN LYNX

LYNCUS BOREALIS.

PLATE X. FIG. 2.

Lynx Cat. PENN. Arct. Zool. Vol. 1, p. 50.
Lynx de Canada. CUV. Oss. Foss. Ed. altera. Vol. 4, p. 413
Felis borealis. TEMMINCK, Monographie, p. 109.
F. canadensis. HARLAN, Fauna, p. 98.
The Northern Lynx. GODMAN, Am. Nat. Hist. Vol. 1, p. 302, figure.
Canada Lynx. RICHARDSON, F. B. A. Vol. 1, p. 101.
F. canadensis. EMMONS, Mass. Report, 1838, p. 27; 1840, p. 32.

Characteristics. Grey, with darker spots. Ears acute, margined with rufous and black. Tail shorter than the head. Soles hairy. Generally larger than the succeeding.

Description, (from a fine adult male in the Collection of Prof. Emmons.) Body raised high on its legs. Head large and rounded. Ears triangular, 2·0 high, 3·5 apart, with long black cylindrical tufts 2·3 high. Eyes large, 1·5 apart. Whiskers stiff, horizontal, arranged in two oblique series, some of the longest 3·5, and white; the posterior series brown horn-color. A broad ruff commences behind or rather beneath the ears, and surrounds the neck, except behind the ears, where there is comparatively a free interval; on the sides of the head it is short, but beneath it is from 3·5 to 4·0 long. (In the female, this ruff is much shorter, and not particolored.) The fur is of two kinds; a long fine wool, intermixed with longer subrigid hairs. On the line of the back, the fur is 1·5 long; on the belly it is loose and pendulous, and 4·5 long. Base of the feet so densely furred as to conceal entirely the soles and claws, which latter are white, long, curved, acute, and channelled beneath.

Color. The general color is grey, intermixed with rufous and black. Margin of the lips, upper margin of the nose and tip of the chin, bright rufous. Nose black, and slightly furrowed in the centre. Front of the head grey. Eyes yellowish in the living state. Ears white in front, margined with rufous, and behind this again bordered with black; posterior part of the ear, light ash; ear tufts black. Ruff white in front, and behind this it is longer and darker, approaching to black beneath; on the sides of the head it is shorter, with a greater admixture of rufous. On the back, the fur varies from reddish brown to blackish brown at the base; then dark brown or black, with hoary tips. Sides light fulvous at base, tipped with hoary. Anterior part of fore and hind legs, light fulvous. On the belly, the long loose hairs are soiled white, with a slight admixture of light fulvous at the base, and here and there scattered bunches of fulvous hairs. Tail rufous above for more than two-thirds of its length, tipped broadly with black; beneath rufous, mixed with lighter colored hairs.

Total length,.....	40·0.	Length of fore paws,..	3·5.
Length of head, ...	7·0.	Ditto of tail (vertebræ),	4·0.
Ditto of fore legs,..	13·0.	Ditto (including fur),..	5·0.
Ditto of hind legs,..	14·0.	Girth at foreshoulder, .	19·0.

This is the *Loup-cervier* of the early French writers, and the *Big Grey Wild-cat* and *Wolverene* of the New-York hunters. It is not uncommon in the northern districts of the State, preying chiefly on the northern hare and other small quadrupeds, and occasionally devouring lambs, pigs, etc. It is a timid animal, and is easily killed. Its progress is said to be a succession of leaps, lighting on all four feet at once, but not advancing with great rapidity: Hence it is probable that it usually obtains its prey by surprise. Contrary to the usual habits of its family, it has no dread of water, but swims well and for a long distance. It breeds once a year, and has two young at a time. Its flesh is tender, but insipid. Its fur is much esteemed, and a skin usually sells for from three to four dollars. It is strictly a northern animal. Its geographical range is between 66° and 43° north latitude.

THE WILD CAT, OR BAY LYNX.

LYNCUS RUFUS.

PLATE X. FIG. 1.—(STATE COLLECTION.)

The Bay Lynx. PENN. Arct. Zool. Vol. 1, p. 51. ID. Hist. Quad. Vol. 1, p. 303, pl. 60.
Mountain Lynx. ID. Arct. Zool. Vol. 1, p. 51. (Variety?)
Felis catus-ferus. LOSKIEL, p. 83.
Felis rufa. TEMMINCK, Monographie, p. 141.
Wild Cat. GODMAN, Am. Nat. Hist. Vol. 3, p. 239, (figure in vol. 1.) EMMONS, Mass. Rep. 1838, p. 27; 1840, p. 31.

Characteristics. A grey spot, bordered with black, behind the ears. Tail nearly as long as the head. Reddish yellow in summer, ashy brown in winter. Soles naked.

Description of an adult male. Head large and rounded. Body rather slender, with the legs disproportionately long. Ears large, subrotund, scarcely acute, with long hairs within; 2·8 high and 3·3 distant, with moderate black tufts scarcely an inch long. Whiskers numerous, about 2·0 long, and for the most part white. Length of the head 6·0, breadth 4·8. Fore legs 10·0 long, with five long, curved, acute, compressed, channelled claws of a greenish white color; the internal claw placed higher up, and rather more curved and robust than the others. Hind feet 12·0 long, with the soles uncovered, and with four claws resembling those on the fore feet. Tail rather slender, slightly curved upwards, and 5·5 in length to the tips of the hairs. The ruff of elongated hairs surrounding the neck, indistinct, and not so conspicuous as in the preceding species.

Female and young with imperfect tufts on the ears.

Color. Generally rufous, with various shades of brown, and darker along the dorsal line, being deepest about the middle of the back. Head obscurely lineated, with black between the ears. Eyelids black, margined with yellowish white. Sides of the nose white, with four

or five parallel narrow interrupted lines of black, running towards the cheeks. Ears fulvous in front, black behind, with a greyish spot in the centre, dilated towards the external margin of the ear. Tail above of the same general color of the upper parts of the body, indistinctly annulated on its sides with dark brown; beneath, white; tip, deep black, intermixed with a few white hairs. Outer sides of the legs rufous, obsoletely barred, and spotted with reddish brown. Insides of the fore legs soiled white, barred with black. (Pennant supposes these bars and the semi-annulated tail to be constant specific characters, but this does not accord with my observations.) Fore paws and hair between the soles, dark brown. Hind legs whitish on the inside, obscurely barred and spotted with black. Chin greyish; throat bright fulvous; belly whitish, irregularly spotted with black.

Total length,	36·0.
Length of head,	6·0.
Ditto of tail (vertebræ),	5·0.

This was a large individual, and, as I think, above the average size, and more distinctly marked than usual. It was captured in the Tonnewanda swamp, Genesee county. The females, I am induced to believe, either have no tufts, or lose them in summer. Even, however, in the case of the males, they can scarcely be considered as resembling the round elongated tufts of the other species.

I am indebted to Prof. Hall, of the Geological Survey, for the specimen which furnished the above description. Prof. Emmons describes this species as rufous, with the insides of the legs spotted with brown, and a triangular patch of yellowish white bordered with blackish behind the ears. Godman, describing the animal as deep reddish with small spots of blackish brown, speaks of nearly vertical streaks of black between the ears. I suppose the Mountain Cat described by Loskiel as having reddish or orange-colored hair, with black streaks, to have been the Bay Lynx.

The *F. rufa* of Richardson, from Columbia river, can not be referred to this species. Several species have been enumerated as inhabiting the United States; but as I have not had an opportunity to examine them, I must pass them over in silence. It is scarcely worth while to burthen our list of American animals with new names, proposed by greedy and unscrupulous writers, for animals which they have never seen, and only know from the brief notes of travellers. It would be desirable if the remarks of Temminck, cited below,* could be continually borne in mind by all writers, not only in reference to this, but every other genus.

The Wild Cat is one of the animals alluded to by Vanderdonck, as being very common in the Colony at its first settlement. A hundred and thirty years ago, they were so numerous in Suffolk county, as to require the interposition of the Legislature. An act was passed in the

* "Ceux qui veulent décrire les Chats sur des individus isolés, seront sans cesse exposés à multiplier les espèces. Il faut avoir vu un très-grand nombre de dépouilles, et s'être adonné à des recherches et à des comparaisons souvent renouvellées, pour émettre une opinion sur la difference specifique de ces animaux, si difficiles de distinguer les uns des autres." (*Monographies, &c.*)

General Assembly, to encourage the destruction of wild-cats; and in 1745, it was still found necessary to renew this act. At present, it is believed that they are entirely extirpated from this and the adjacent counties. They are still found in the more northern and western counties, in the wooded districts, where they prey upon birds and the smaller quadrupeds.

FAMILY VIII. PHOCIDÆ.

Teeth various. Feet short and fin-shaped, not free, the phalanges being enveloped in the teguments. Hind feet horizontal. Rarely leave the water. Piscivorous.

Obs. Some of the species are of great bulk, and all contribute in various ways to the wants of mankind. I am acquainted with the type of but one genus within this State.

GENUS PHOCA. *Cuvier.*

Head rounded. No external ears. Eyes very large. Feet with five toes, connected by a thick membrane. Mammæ two, pectoral. Tail short and thick. Teeth of three kinds: Incisors, $\frac{6}{4}$; *canines,* $\frac{2}{2}$; *cheek teeth,* $\frac{10}{10} = 34$. *Cheek teeth trenchant, many-lobed.*

Obs. To this genus, as restricted by Cuvier, belong at present about thirteen species, more or less perfectly indicated. The difficulty of examining the individuals of this family must be very great. A recent English writer states, that "little more is known of the Common Seal, "though an inhabitant of our own seas, than of those which are met with in the most distant "latitudes."

THE AMERICAN SEAL.

PHOCA CONCOLOR.

PLATE XVIII. FIG. 2.—(STATE COLLECTION.)

Phoca vitulina? MITCHILL, Am. Month. Mag. Vol. 3, p. 357.

Characteristics. Uniform dark slaty grey. Young, entirely light yellow. Length, four feet.

Description (*of a female caught in the Sound near Sands' Point.*) Body elongated, cylindrical, tapering gradually from the chest to the tail. Head broad and rounded, with the muzzle broad and truncated. Nostrils sublunate, 0·8 long. Tongue deeply emarginate at tip, and ciliated in the notch. Auditory opening 1·5 behind the eye, with a small mammillary elevation about 0·25 high on its anterior border. Whiskers white, with short bevels on the edges; disposed in five or six rows, the posterior stoutest and longest; from 4 – 6 in a group above, and somewhat behind the eye. In repose, the web of the fore feet extends almost to the tips of the claws; these are 1·5 long, gradually decreasing in size from the anterior: claws robust, flattened, incurved. When the web is extended, the edge is slightly webbed,

almost straight. Hind feet with short flattened claws, of which the three middle ones are smallest, none exceeding the membrane, which, when extended, is undulated or scolloped; under side, in a state of repose, gathered into two large folds. Tail spatulate, pointed, 2·5 wide at the base.

Teeth. Lower incisors disposed in a curved line, concave outwards; upper canines are strongest, and when the jaws are closed, include the lower. First cheek tooth small, trilobate; the others multilobate, and increasing in size backwards.

Color. Uniform dark slaty grey; but in the water, this appeared of a glossy blackish grey, slightly lighter beneath. Fore foot horn-color, mottled with darker. Young, soiled yellowish white, with indistinct traces of longitudinal marks.

Total length,	51·0.
Length of tail,	3·5.
Weight,	129 lbs.

We cite few synonimes, as we are inclined to believe that previous naturalists have taken it for granted, without due examination, that our Seal and the European are identical. Among the many American seals which we have examined, none have presented very distinctly the blackish or brown spots indicative of the *P. vitulina*, except in one specimen, which was evidently a pup of less than a year old.*

The Common Seal, or Sea-dog, as it is frequently called, breeds in the autumn, bringing forth commonly two at a birth. They are now comparatively rare in our waters, but were formerly very abundant. A certain reef of rocks in the harbor of New-York is called *Robin's reef*, from the numerous seals which were accustomed to resort there; *robin* or *robyn* being the name in Dutch for *seal*. At some seasons, even at the present day, they are very numerous, particularly about the Execution rocks in the Sound; but their visits appear to be very capricious. The seal noticed above had a nearly fully developed fetus; and as it was killed on the seventh of February, the time of parturition may be placed nearly about this period. Some authors assert that this takes place at any and every period of the year, but this seems highly improbable. Mr. Everson informs me that he has taken them, almost every year, in the River Passaic, in the fyke-nets, much to his regret; for they generally do great injury to his net, and always make an obstinate resistance. We have but few notices of seals on our coast, unless in mere paragraphs in the public journals, hastily drawn up by persons unacquainted with natural history. In the Kingston (U. C.) Chronicle of February, 1823 or '24, there is a notice of a seal having been taken on the ice on Lake Ontario, near Cape Vincent (Jefferson county) in this State. The paper gives no description, but asserts, on the

* When I drew up this description, I was not aware of the true specific characters assigned to the *Phoca vitulina* by Prof. Nillson, and have had since no opportunity of verifying them upon the Seal of the coast of New-York. These characters are, 1, the oblique position of the molar teeth, by which the internal posterior margin of one is in contact with the outer anterior margin of the next behind it; 2, the posterior margin of the palate deeply notched; 3, the external process of the nasal bone elongated and rounded, while the inner is not more than half the length of the former, and with its fellow makes a small triangle.

authority of Indian traders, that seals have heretofore been seen on the borders of the Lake, though the circumstance is one of rare occurrence. A species of seal was captured, some years since, near Lynn, Massachusetts, which is mentioned in the newspapers as being beautifully spotted, especially on the under side, and referred to the *P. vitulina*. In August, 1824, a seal was exhibited alive in New-York, which had been taken in a seine in the Chesapeake, near Elkton, Maryland. Dr. Mitchill, who saw it, supposed it to be the *P. vitulina;* although, as he states in a newspaper paragraph, "in the written account, (alluding to a "description he had drawn up in 1818 of a seal taken near Amboy,) there is no note "of the natural mark in the breast of the present creature, nor of more than five claws on "the fore feet." What this *natural mark* could have been, or what is meant by more than five claws, must be left to conjecture, or to await the examination of another individual.

GENUS STEMMATOPUS. *F. Cuvier.*

Form and habits of the preceding, but the head is furnished with a dilatable hood. Teeth 30; *four incisors above, and two beneath.*

Under the barbarous name of *Mirounga*, Mr. Gray has proposed to group together several species of this family, which are characterized by "the nose elongated into a trunk, and the "teeth with simple roots." In the present state of our knowledge of this family, we prefer the name and characters noted above.

THE HOODED SEAL.

STEMMATOPUS CRISTATUS.

PLATE XV. FIG. 1.

Phoca cristata. GMELIN.
Hooded Seal. PENN. Arct. Zool. Vol. 1, p. 162.
P cristata. DE KAY, Ann. Lyc. New-York, Vol. 1, p. 94, pl. 7. KING & LUDLOW, ib. p. 99. HARLAN, Fauna, p. 106. GODMAN, Am. Nat. Hist. Vol. 1, p. 336, figure.
The Crested Seal. HAMILTON, Nat. Hist. Amphibious Carnivora, p. 197, pl. 14.

Characteristics. Grey, varied with brown. Nasal sac bright brown. Feet blackish brown. Length 6 – 7 feet.

Description. Body robust, cylindrical, tapering gradually to the tail, and covered with flattened decumbent hairs. Head small in proportion to the body, with a moveable muscular bag on its summit, extending from the muzzle to about five inches behind the eyes, and in certain positions nearly covering the internal canthi. This sac is twelve inches long, and when fully distended, nine inches high, covered with short hairs, and with slight transverse wrinkles. The nostrils are round, each two inches in diameter, and pierced in the anterior part of this hood. When the hood or nasal sac is not inflated, the septum nasi can be distinctly felt, elevated into a ridge about six inches high. Eyes large, distant 6·5 from the

extremity of the muzzle. Ear openings distinct, two and a half inches behind and beneath the eyes. The cheeks and nasal sac, with 25 – 30 strong whiskers on each side, arranged in rows converging forwards; those of the upper series, small and black; of the lower, very stout, white, flattened, and about 5·0 long: all directed downwards. Under the lens, they exhibit alternate short bevels on each side. Anterior swimming paws fifteen inches long, arising about twenty inches from the end of the jaw, and furnished with five strong, compressed, channelled claws, of which the external is largest. Posterior feet of same length, with their webs lunated, fifteen inches wide, and furnished with five flattened nails not extending, either in the fore or hind feet, to the end of the web. Tail three inches wide at base, flattened and tapering to the tip, and covered with hair similar to that on the body.

Teeth. The incisors above cylindrical, contiguous; the exterior largest, and nearly half as large as the canine; the upper canines larger than those below, and more incurved. The incisors below, very small and cylindrical. Cheek teeth in both jaws small, distant and trenchant, with a notch on the posterior part of the edge; the first remote from the canine, and smallest.

Color. Grey and dark brown, distributed in irregular patches; on the abdomen, the grey predominates. Eyes represented as dull greenish. Nasal sac bright brown or rufous. Fore and hind feet of a uniform blackish brown. Claws dark at base, light horn at their tips.

Total length,	90·5.
Length of tail,	6·5.
Weight,	5 – 600 lbs.

This description was taken from an adult male captured near Eastchester, about fifteen miles from the city. It made considerable resistance, emitted a bellowing noise when attacked, and exhibited no symptoms of fear.

This is an inhabitant of the northern regions, having been seen as high as the seventieth parallel. The preceding must be considered as the first notice of its existence within our territorial limits, where it can only be regarded as a rare and accidental visitor.

(*EXTRA-LIMITAL.*)

Genus TRICHECUS, *Lin.* Form and habits of the preceding genera. Four incisors above in the young, none below. Two canines enlarged into enormous tusks. Cheek teeth, $\frac{6}{4} - \frac{3}{4}$; the last above rudimentary, deciduous.

T. rosmarus. Walrus or Morse. (GODMAN, Vol. 1, p. 354, figure.) Tusks 12·0 – 36·0 long. Skin with short yellowish brown hair. Length 12 – 15 feet.

OBS. These were formerly numerous on our coast, but are now scarcely ever found south of Cape Sable.

(FOSSIL.)

T. virginianus. (Plate 19, fig. 1, A, B. Ann. Lyc. N. Y. Vol. 1, p. 271. Cab. Lyceum.) Cheek teeth with obliquely truncated crowns, not ridged; the second smaller than the first. *Accomac county, Virginia.*

ORDER IV. RODENTIA.

No canine teeth. Incisors for the most part two in each jaw, large, strong, and remote from the grinders. (In Leporidæ there are 2 – 4 – 6 in the upper jaw.) Cheek teeth twenty-two at most. Toes distinct, with small conical claws. Jaws moveable horizontally. The greater number furnished with stout clavicles. No abdominal pouch.

This order comprises a great number of the smaller quadrupeds, living almost exclusively on vegetable food. According to the latest enumeration, there are nearly three hundred species distributed over the globe. In North America, upwards of seventy species have been described; and we shall doubtless have many more to add to the list, for it is among these small quadrupeds that we are to find new species. We divide this order into five families.

FAMILY I. SCIURIDÆ.

Grinders simple, with tubercular summits. Upper incisors chisel-shaped; the lower pointed, compressed laterally. Incisors, $\frac{2}{2}$; *molars,* $\frac{8 \cdot 10}{8} = 20$ *or* 22. *The fifth upper anterior molar exists only in the young.*

GENUS SCIURUS. *Linneus.*

Body elongated. Eyes large. Ears erect. Upper lip divided. Posterior extremities longer than the anterior, which have four long distinct toes, and a tubercle covered with an obtuse nail in place of a thumb. Eight teats; two pectoral, the remainder ventral. Tail long, with long bushy hair, often distichous or directed laterally.

Obs. All the species of this genus live mostly on trees; for which purpose, their long flexible toes, with acute nails, enables them to leap from tree to tree, rarely missing their hold. They feed on seeds, nuts, grain, and occasionally worms. About forty species have been described.

THE LITTLE GREY SQUIRREL.

Sciurus leucotis.

PLATE XVIII. FIG. 1. — (STATE COLLECTION)

Lesser Grey Squirrel. Penn. Hist. Quad. Ed. secunda.
Hudson's Bay Squirrel. Var. a, *Carolina.* Penn. Ib. Vol. 2, p. 147, Ed. tertia.
Hudson Squirrel. Var. a, *Carolina.* Id. Arct. Zool. Vol. 1, p. 116. (Variety.)
Sciurus cinereus. Harlan, Fauna Am. p. 173.
S. carolinensis. Godman, Am. Nat. Hist. Vol. 2, p. 131, pl. fig. 2.
S. leucotis. Gappar, Zool. Journ. Vol. 5, p. 206. Bachman, Mag. Nat. Hist. 1839, p. 220.
Common or *Little Grey Squirrel.* Emmons, Mass. Rep. 1840, p. 66.

Characteristics. Grey above, lighter beneath; sides of head and legs tinged with rufous. Ears not pencilled, soiled whitish behind. Tail rather longer than the head and body, edged with white. Length 15·0.

Description. Forehead arched. Ears somewhat pointed, but rounded, and covered with short hairs; no pencil of hairs at the tips. Whiskers black, as long as the head. Tail large and bushy.

Color. This is subject to great variations, depending upon age and season; but the following may be considered as tolerably constant: Above, bluish grey. Chin, throat and all beneath, white. The sides of the head and ears, the flanks, anterior part of the forelegs and the sides of the hind legs of a ferruginous or fawn-color of various shades of intensity, generally most conspicuous on the hind legs. Frequently on the lower part of the cheeks a bright fulvous spot, and occasionally an obscure stripe of brown on the back, reaching to the base of the tail. Tail edged with whitish. — Head and body, 8·0. Tail, 8·5.

Young. Space round the eyes, the nape, foreshoulder and flanks light reddish brown. Summit of the head, outer parts of the legs, the back and rump blackish. Belly and inner part of the legs brown. Tail blackish, intermixed with fulvous, and light fulvous on the margin. These are usually mistaken for hybrids between the black and grey.

Var. A. All the upper parts of the body tawny.

Var. B. Entirely dark brownish or black. This is taken frequently for the Black Squirrel, and by others supposed to be a hybrid between the *little grey* and *black*, but erroneously so. Common in various counties.

Var. C. A dark stripe on the flanks, margined above with reddish. *Rockland county.*

Var. D. Two reddish lateral stripes in both the adult and young, but more distinct in the latter.

Var. E. Abdomen bright ferruginous.

This well known little animal is found in every forest abounding in nuts of various kinds. They prepare their retreats in the hollow part of some tree, at a distance from the ground, and produce from four to six at a birth. In the season, they are exceedingly irritable and pugnacious; but the popular belief that the males emasculate each other, is unfounded, these parts (in the young more especially) being often retracted within the abdomen.

One of the most remarkable peculiarities of this species, is its singular and distant migration in large bodies. Bachman (*Op. sup. cit.* p. 226) has furnished an interesting account of an extraordinary migration of this sort, which he witnessed in the autumn of 1808, a short distance above Albany. On that occasion, troops of squirrels suddenly and unexpectedly made their appearance. They swam the Hudson in various places between Waterford and Saratoga. Those which were noticed crossing the river, were swimming deeply and awkwardly, with their bodies and tails wholly submerged. Many were drowned; and those which were so fortunate as to reach the opposite bank, were so wet and fatigued, that they were readily killed with clubs. On that occasion, their migration did not extend farther than

the mountains of Vermont. An unusual and general failure of their requisite food is, of course, the motive for such migration. This species, in common with the others, feed on berries, seeds and nuts, particularly hickory nut (*Carya alba*), of which they are very fond, and make large hoards for their winter supply. They also attack wheat and maize in its unripe state. Their depredations in this way are often so considerable that parties of men and boys sally forth for what is called a *squirrel hunt*, and almost incredible numbers are thus destroyed in a single day. In districts well peopled, it can scarcely be considered as a species injurious to man.

The Squirrel has a wide geographical range. Of its western limits we are not informed; but along the Atlantic, it is found from Hudson's Bay to Carolina.

THE FOX SQUIRREL.

SCIURUS VULPINUS.

PLATE XVIII. FIG. 3.—(STATE COLLECTION.)

Sciurus vulpinus. GMELIN.
The Fox Squirrel. GODMAN, Am. Nat. Hist. Vol. 2, p. 128.
S. vulpinus. Grey or *Fox Squirrel.* EMMONS, Mass. Report, 1840, p. 66.

Characteristics. Grey above, white beneath. Much larger and more robust than the preceding. Length 25·0 – 30·0.

Description. Body robust. Eyes large and prominent. Ears 0·6 high; the hair on the posterior surface projecting 0·2 beyond the margins, but not forming a distinct tuft or pencil. The whiskers project horizontally two inches on the sides of the nose; a few bristles over the eyes, and a patch of the same beneath and posterior to the eyes. Legs robust, with stout, compressed, curved, dark brown claws. Tail exceedingly voluminous.

Color. Sides of the nose, the chin, throat and abdomen white. Summit of the head blackish, occasioned by the predominance of long uniformly black hairs. Sides of the cheeks fulvous; the hair on the ears of a somewhat brighter tint. Nape and all above of a grey color, the hair being dark slate at the base, then light fawn, afterwards black, and finally white at the tips; intermixed with these, and much longer, are hairs uniformly black throughout. Anterior parts of the extremities light fawn, becoming still lighter on the toes. Tail indistinctly annulated with black and white, and when viewed from above, appears bordered on each side with black, the white tips of the hairs projecting beyond this margination. Each hair is distinctly annulated with white and black; the last black annulation preceding the white tip being wider, and of a deeper hue than the others.

Length of head and body, ...	13·0.
Ditto of tail (vertebræ), ...	11·5.
Ditto ditto (including fur), ...	15·5.

Many persons imagine that this is but a larger race or variety of the Little Grey Squirrel; and indeed they agree in every particular, except their size. We suspect that Godman's *Fox Squirrel*, as well as his *Cat Squirrel*, are varieties only of the Hooded Squirrel, and not to be referred to our northern animal. Prof. Emmons states that its flesh is not so sweet or white as that of the little grey squirrel. Varieties are occasionally met with, tawny, and dark brown. Its habits and geographical distribution are the same as in the preceding.

THE BLACK SQUIRREL.

SCIURUS NIGER.

PLATE XVII. FIG. 1.

Sciurus niger. SAY, Long's Exped. Vol. 1, p. 262. HARLAN, Fauna, p. 177, (excl. syn.) GODMAN, Am. Nat. Hist. (excl. syn.) Vol. 2, p. 133, figure.
Black Squirrel. RICHARDSON, F. B. A. Vol. 1, p. 191.
S. niger. BACHMAN, Mag. Nat. Hist. 1839, p. 335.
The Black Squirrel. EMMONS, Mass. Report, 1840, p. 67.

Characteristics. Entirely glossy black; a shade lighter beneath. Claws covered with hair. Hind legs with a few scattering hairs beneath. Length 12·0 – 14·0.

Description. Body more gaunt and slender than in the Little Grey Squirrel, and the head narrower between the eyes. Ears 1·3 apart, broad, with the posterior slope nearly straight; tips subacute, not pencilled, but with hairs of the posterior surface extending beyond them. Whiskers in two series on the sides of the nose, longer than the head, two or three above the eyes, and a patch of three or four on the cheeks. Outer and inner claws of fore feet subequal, the outer slightly shortest; a few long black hairs on the posterior part of the fore legs; the two middle claws of the hind feet equal; posterior part of hind leg nearly naked. Tail cylindrical, scarcely distichous. Fur softer and finer than in the little grey squirrel. Molars eight above.

Color. Glossy jet black. Base of the fur above, deep slate; beneath, it is light grey. Palms flesh colored.

Length of head and body,	13·0.
Ditto of tail (vertebræ),	10·0.
Ditto ditto (including fur),	13·0.

It is usually supposed that the winter fur of this species is most intensely and generally black. The homogeneousness of color may be found at all seasons; for we have killed them in July and August, in the western part of the State, intensely black.

The confusion alleged to exist in the descriptions of our Squirrels, and more especially in relation to this species, may be thus explained: Catesby (Nat. Hist. Car. Vol. 2, p. 73) figured a species, subsequently known as a variety of the Hooded Squirrel, *S. capistratus*. Linnæus, in his twelfth edition, gives it the name of *niger*, citing Catesby, but without any

specific phrase. Brisson (Règ. An. Vol. 1, p. 105) refers to the same plate, which he pronounces excellent. Pennant (Arct. Zool. Vol. 1, p. 119) adopts the same course, considering it as *S. niger*. In this he is copied by Erxleben (p. 417), and by Schreber (Saugth. Vol. 2, p. 776), which latter reproduces Catesby's figure. The dark brown or black variety of the Little Grey Squirrel has also been described as the *niger;* and from these various sources, so much confusion has arisen, that Cuvier, in the first edition of his *Règne Animal*, supposes the black and little grey squirrels to be varieties of *capistratus*. In the second edition, he is silent on the subject, and his American editor supposes the black squirrel to be a variety of the grey. In the catalogue at the end of the volume, which is understood to have been furnished by Major Le Conte, the Black Squirrel, as a species, is suppressed. Harlan, Godman and Richardson, have very properly restored it to its place in the systems. Precise technical naturalists may, however, deem it proper to restore the name of *niger* to *capistratus*, and give the present species a new name. They are, however, now so firmly established and generally known, that little would be gained by the change. It appears to be well authenticated that it disappears before the little grey squirrel. We have been assured by many credible persons, that in certain districts where formerly none but black squirrels were seen, their place is now almost exclusively occupied by the grey squirrel.

This species appears to have but a limited latitudinal range. It is found throughout the western counties of the State. Few are found south of Pennsylvania. Westwardly its distribution has not been ascertained. Habits the same as the preceding.

THE RED SQUIRREL

SCIURUS HUDSONICUS.

PLATE XVII. FIG 2.—(STATE COLLECTION)

Hudson's Bay Squirrel. PENNANT, Arct. Zool. Vol. 1, p. 116. ID. Hist. Quadr. Vol. 2, p. 147.
Sciurus hudsonicus, Var. e, *vulgaris.* ERXLEBEN, p. 416.
Red Squirrel. WARDEN, Hist. U. S. Vol. 1, p. 330.
Red Barking Squirrel. SCHOOLCRAFT, Journal, p. 273.
S. hudsonius. HARLAN, p. 185. GODMAN, Vol. 2, p. 138, figure.
The Chickaree. RICHARDSON, F. B. A. Vol. 1, p. 187, pl. 17. BACHMAN, Mag. Nat. Hist. 1839, p. 383.
Common Red Squirrel. EMMONS, Mass. Report, 1840, p. 67.

Characteristics. Reddish above, white beneath. Ears slightly tufted. Tail shorter than the body.

Description. Forehead rounded. Whiskers numerous, black, longer than the head. Ears short, broad and rounded; furnished with long hairs projecting beyond the margin, but rarely, if ever, distinctly tufted. Legs robust; fore feet with the rudiment of a thumb nail. All the claws sharp, compressed, and much incurved. Teeth as in the other squirrels; that is to say, ten molars above, the deciduous molar falling very early. Tail not as long as the head and body, not very bushy, and somewhat distichous.

Color. Above deep reddish brown, with scattering darker hairs; dark grey at base.

Cheeks, and all beneath, white, separated along the flanks by a black line, which in some individuals is very indistinct: in specimens from high northern latitudes, it appears to be generally absent. Tail deep reddish brown above, with blackish hairs on the borders; on the under side it is rufous in the middle, then black, and tipped with brown.

Length of head and body,	8·0.
Ditto of tail (vertebræ),	5·0.
Ditto ditto, including fur,	6·5.

This familiar and well known species is found from the Arctic circle to the mountainous ranges of North Carolina and Tennessee. We observed, in the northern part of the State, a remarkable variety, which presented the following appearance: The whole upper part of the head and body, with the exception of a large reddish spot on the left flank, was of a light ash grey; the reddish spot was separated from the white beneath, by a deep black border. Tail white, intermixed with a few dark hairs.

The Red Squirrel is a noisy little animal, and its twittering note of *chick-a-ree* has suggested one of its popular names. It feeds on fir-cones, hickory and other nuts, and also on the seeds and buds of trees. In the northern counties, its greatest enemy is the Sable, and from him it requires all its well known agility to escape. It takes to the water readily, and, as we have noticed, swims tolerably well. It dives, too, in order to avoid a threatened blow. It feeds also upon wheat, rye and buckwheat; but its injuries to the farmer must be very limited. Its habits appear to be influenced by the climate; for at the north it forms deep burrows in the earth, under the roots of trees, to protect itself from the cold; whilst in this State, it contents itself with occupying a hollow in a tree. Its flesh is juicy and tender, and is generally preferred, as an article of food, to the other species. Its geographical range is from the mountainous districts of North Carolina, to the sixty-eighth degree of north latitude.

THE STRIPED SQUIRREL.

SCIURUS STRIATUS.

PLATE XVI. FIG. 1.—(STATE COLLECTION.)

Sciurus striatus. LIN. 12th ed. p. 87.
Striped Dormouse. PENN. Arct. Zool. Vol. 1, p. 126.
Das Schwartz Gestreichte Erd-Eichhorn. SCHREBER, Vol. 2, p. 790.
S. striatus. HARLAN, p. 183. GODMAN, Vol. 2, p. 142, figure.
S. americanus. KUHL.
S. (Tamias) lysteri. RICHARDSON, F. B. A. p. 181, pl. 15.
The Striped Squirrel. EMMONS, Mass. Report, 1840, p. 68.

Characteristics. Reddish brown; a black dorsal stripe, and a shorter light-colored lateral stripe bordered with black.

Description. Body shorter and more robust for its size, than in the preceding species. Head slightly rounded towards the nose. Ears ovate, rounded; the hair slightly exceeding the mar-

gins, but not in a tuft. Whiskers few, and extending beyond the eyes. Fore feet with four compressed, curved claws, and the rudiments of a thumb; the two middle claws longest and subequal, all partially covered with hair; soles with five tubercles. Hind feet long, with the three middle toes subequal. Tail slender, rather cylindrical above, distichous on its lower surface. Molars eight above. Dilatable cheeks, not forming distinct pouches.

Color: Forehead tawny mixed with black, with a small black spot above the nose. A slight whitish mark above and beneath the eyelids, becoming dilated towards the ears, with an intermediate black dash in the same direction passing through the eye. Upper part of the neck, anterior part of the back, and superior surface of the tail, grey mixed with black. Flanks greyish, passing into reddish on the rump and thighs. The cheeks, throat, breast, belly and internal parts of the fore legs and thighs, white more or less mixed with light ash. A narrow chesnut brown dorsal stripe commences between the ears, becomes dilated and darker on the back, and ends about an inch from the tail. A short white stripe is parallel with this on each flank, bordered above and below with black, the lower black border frequently much dilated. These longitudinal markings are frequently treated as composed of five parallel black lines. The space between the lateral and dorsal stripes grey. Rump bright tawny. The under side of the tail fulvous, bordered with black and grey.

Length of head,	1·7.	Of tail (vertebræ),	3·8.
Ditto of body,	5·5.	Ditto (including fur),	4·5.

This common species is well known under the various popular names of *Hucky*, *Ground Squirrel*, *Chipping Squirrel*, *Chipmuck*; the latter, we apprehend, being its aboriginal name in this State. There appears to be a doubt with some naturalists, whether the Asiatic and American animals are identical. Dr. Richardson appears to consider their identity as not yet proved by actual comparison, and proposes for the American the name of *Tamias lysteri*, giving Ray the authority for the specific name. The descriptive history of this species appears to be this: It was originally noticed by Ray in 1683, in his *Synopsis Methodica Animalium*, p. 216, without giving it a name. "Huic (*S. getulus*, Caii apud Gesnerum, the "Barbary Squirrel) similis est Sciurus a Cla. Dom. Lyster observatus, et sic descriptus: "Sciurus e minoribus est rufis cineriisque pilis fere ad similitudinem vulgaris muscovitici "coloratur; in medio dorso unica linea ex toto nigra; itemque ad utrumque latus altera eaque "latiusculæ quidem, at multo brevioriis earumque etiam media albicant. Huic cauda brevis, "corpore concolore at nigrior, et raris pilis donatus, etc." It was subsequently noticed by Edwards & Catesby; by Linneus, in 1754; in the *Mus. Ad. Fred.*, by Pallas; by Schreber, in 1755; and in the last correct edition of the *Systema*, 1766, Linneus describes *striatus*, quoting Catesby & Edwards, and considering their animal as identical with that of Siberia. Desmarest (*Dict. Sc. Nat.* Vol. 52, p. 170) appears to doubt whether they are identical. We may here remark, by the way, that his description of the American *striatus* appears to have been drawn up from a young or very small specimen. From Daubenton's description of the Asiatic species, the chief differences appear to be the following: In the latter the tail is black towards the extremity, tipped with white; the intermediate space between the dorsal

and lateral stripes, light yellow. These are trivial differences, such as might occur between two individuals of the same species. The size of the two species sufficiently coincide.

The laborious compiler Schreber describes carefully the Asiatic Squirrel, and the following appears to be the principal points: "Eyelids bare and dark brownish on the margins. Color "of the head, neck, sides and outer part of legs yellowish (griseo-lutescens.) On the sides of "the head are four alternate pale and brown stripes. Tail above blackish, beneath yellowish; "along its sides, a darkish obsolete border, etc."

The genus *Tamias* of Illiger, we deem founded on unimportant or insufficient character, if applied to our species. Its habits might seem to imply an organization somewhat different from the other squirrels; but neither the slight difference in the deciduous upper anterior molar, nor the situation of the brain, are of themselves sufficiently important. The tail of the Ground Squirrel is distinctly distichous; and the cheeks, though susceptible of great dilatation, do not form true cheek pouches.

The Ground Squirrel is usually seen running along fences, and particularly attached to stone walls, which afford him a ready retreat. Under these he makes his burrow, in which he lays up his store. A favorite spot is the centre of some decayed stump. It rarely ascends trees, and only when its retreat is cut off from its hiding place. It appears to be of an irritable disposition, resisting every attempt at domestication. Its food is the same as with the other species. It is stated by Prof. Emmons to be occasionally injurious to maize, by destroying the kernel when the plant is just out of the ground.

It is common over all the State. Its geographical range, in this country, appears to be included between the fiftieth and thirty-third parallels of latitude.

(*EXTRA-LIMITAL.*)

S. carolinensis, Bosc. (Bachman, Mag. Nat. Hist. 1839, p. 330.) Rusty grey, white beneath; ears nearly naked; anterior molar in upper jaw persistent. Tail as long as head and body. Smaller than *leucotis*. Length 17·0. *Southern States.*

S. macrourus. (Say, Long's Exp. Vol. 1, p. 115.) Black and grey above. Tail very large. Length 19·0 – 20·0. *Missouri.*

S. audubonii. Black above, beneath brownish. Tail equal to length of head and body. Smaller than *niger;* ears shorter. Length 23·0. *Louisiana.*

S. quadrivittatus. (Say, *Op. cit.* Vol. 2, p. 45.) Head with four white stripes; on the back, four broad white lines alternating with darker ones. Head and body 4·2; tail 3·0. Allied to *striatus.* *Rocky Mountains.*

S. fuliginosus. (Bachman, *Op. cit.* p. 380.) Black above, grizzled with brownish yellow. Tail flattish, much shorter than the body. Length 18·5. *Mississippi.*

S. richardsonii. (Bachman, p. 386. Lewis & Clark.) Rusty grey above, whitish beneath; end of tail black, and shorter than the body. Length 11·2. *Rocky Mountains.*

S. douglasii. (Bachman, *Op. cit.* p. 382.) Dark brown above, brighter buff beneath. Tail shorter than the body. Length 14·6. *Columbia River.*

S. capistratus. (Fox Squirrel of Bachman, p. 117.) Usually grey; ears and nose white; fur coarse. Tail longer than head and body. Length 29·5. Largest of the genus. *Southern States, New-Jersey.*

S. lanuginosus. (Bachman, p. 387.) Yellowish grey above, silver-grey on sides, beneath white. Tail shorter than the body. Palms and inner surface of toes thickly clothed with silky hairs. Fur soft and downy. Length 14·0. *Columbia River.*

S. nigrescens. (Bachman, p. 334.) Black above, slightly varied with grey; sides of the neck, upper part of thigh and rump pale yellow, beneath soiled grey; feet black. Tail longer than body. Length 27·5. *California.*

S. collei. (Richardson, App. Beechy.) Above varied with black and yellow, beneath white; feet white; cheeks greyish. Tail less than length of head and body. Length 20·1.

GENUS PTEROMYS. *Illiger.*

Teeth as in the preceding genus. Ears round. Upper lip divided. Toes elongated, deeply divided. The skin dilated on the sides from the fore to the hind legs, forming a sort of parachute in the air.

Obs. This genus at present embraces nine species, of which two are found in America, one in northern Europe, and the remainder in Java. Some of the species are nocturnal.

THE SMALL AMERICAN FLYING SQUIRREL.

Pteromys volucella.

PLATE XVI. FIG. 2 — (STATE COLLECTION.)

Sciurus americanus volans: Ray, Synop. Quad. p. 215.
Flying Squirrel. Penn. Hist. Quad. Vol. 2, p. 153, No. 351.
Sciurus volucella. Gmelin.
Flying Squirrel. Penn. Arct. Zool. Vol. 1, p. 120.
Pteromys volucella. Harlan, Fauna, p. 187.
Common Flying Squirrel. Godman, Am. Nat. Hist. Vol. 2, p. 147, figure. Emmons, Mass. Report, 1840, p. 69.

Characteristics. Brownish ash, tinged with cream color on the body, above; darker on the membrane, which is bordered with white. Length 9·0 – 10·0.

Description. Head short and rounded; muzzle rather obtuse. Ears large, broad, membranous, nearly naked, and 0·5 high. Eyes large, brilliant and prominent. Whiskers numerous, some of them three inches in length. Claws feeble, compressed, convex and acute, nearly covered by hairs; the two middle claws of the fore feet subequal, longest on the hind feet, the inner toe shortest. Tail flat, distichous, linear, rounded at the tip, 1·2 broad. The fur particularly fine and soft; on the extremities beyond the membrane, it is very short.

Color. Head mouse-grey. Orbits of the eyes margined with black. Sides of the nose, cheeks, and all beneath pure white, with occasionally a slight tinge of reddish on the under

side of the tail. Body above with a rufous tint, the dark slate-colored hairs being tipped with that color. On the upper side of the flying membrane, the predominating color is dark brown, varied slightly with faint reddish brown, becoming darker near the edge, which is bordered with white, and occasionally cream-color. Tail, on its upper surface sometimes bright reddish, at other times uniform with the color of the back.

Length of head, ...	1·3.	Of tail (vertebræ), ...	4·0.
Ditto of body, ...	4·0.	Ditto (including fur), ...	5·0.

The dimensions of this squirrel are usually smaller than in the specimen from which the above description was taken.

The Flying Squirrel is well known throughout this State. The expanded fold of skin is in many species supported by a small bone, articulated to the wrist. In the American species, this is rudimentary. By the aid of this membrane, they are enabled to dart from one tree to another, not by an actual movement of the membrane, as we have seen among bats; but by sailing obliquely downwards, and rising suddenly when within a few inches of the tree upon which they mean to alight. In this sailing movement, they are aided, and perhaps slightly guided by their broadly expanded tail. They form their nests in hollow trees, from which they are easily roused by striking on the trunk. They are of a gentle disposition, and easily domesticated; are fond of warmth, and will sleep during the whole day, closely pressed against the body of their master. At twilight they arouse themselves, and afford much entertainment by sailing about the room, always commencing their flight by climbing to a chair, table or shelf. It brings forth three or four at a litter, and lives exclusively on nuts, seeds and buds. It does not appear to be found far beyond the great lakes, but extends through the United States. According to Lichtenstein, it occurs in Mexico.

(*EXTRA-LIMITAL.*)

P. sabrinus. (Richardson, Vol. 1, p. 193, pl. 18.) Resembles the preceding, but is much larger. Length 12 inches. *Arctic America, Sault St. Marie.*

P. oregonensis. (Bachman, Ac. Sc. Vol. 8, p. 101.) Ears longer than in *sabrinus.* Brown above, beneath white. Length 12 inches; alar extent 9 inches. *Oregon.*

FAMILY II. ARCTOMIDÆ.

Head large, and somewhat flattened. Ears short and rounded. Molars ten above and eight below; anterior surface of incisors rounded, the upper surface ridged and tuberculous. Body thick and heavy, with short limbs. Tail bushy, moderate or short. Some species with cheek pouches. All burrow and hybernate.

This group, which is closely allied to the Squirrels, comprises many small animals, which have been indifferently referred to Squirrels or Marmots. America is particularly rich in species, but few are found within the limits of the Union, and but one within our State.

(*EXTRA-LIMITAL.*)

Genus SPERMOPHILUS, *F. Cuvier.* Ample cheek pouches, commencing at the commissure of the lips, and extending to the sides of the neck; the anterior ridge on the upper cheek teeth nearly obsolete, and the internal spur much developed. Tail long and linear, bushy.

S. tredecimlineatus, Mitchill. (RICHARDSON, pl. 14.) Six to eight yellowish longitudinal stripes, the intermediate spaces with black spots. Length 8 – 10 inches. ***St. Peter's River.***

S. lateralis. (SAY, Long's Exped. Vol. 2, p. 46. RICHARDSON, pl. 13.) A yellowish white stripe on each flank, bordered with black. Length 10 – 12. ***Rocky Mountains.***

S. douglasii. (RICHARDSON, Vol. 1, p. 172.) Hoary brown above, with a black stripe between the shoulders; pale brown behind, with indistinct black marks. Length 12 – 13. ***Columbia River.***

S. beecheyi. (RICHARDSON, pl. 12. B.) Above reddish varied with blackish, beneath brownish yellow. Tail long, bushy and round. Length 17 inches. ***California.***

S. franklini. (RICHARDSON, pl. 12.) Yellowish brown above, thickly spotted with black; greyish white beneath. Tail long. Length 16 inches. ***Arctic Regions.***

S. richardsoni, Sabine. (RICHARDSON, pl. 11.) Yellowish grey above, varied with black; beneath pale orange; very short ears. Length 16 inches. ***Arctic Regions.***

S. grammurus. (SAY, Long's Exp. Vol. 2, p. 72.) Cinereous tinged with reddish; fur coarse and flattened. Three black lines on the tail. Length 21 inches. ***Rocky Mountains.***

S. guttatus, Temminck. (RICHARDSON, Vol. 1, p. 162.) Clove-brown above, spotted with white; beneath and feet ochraceous; no external ears, and short tail. ***An Spermophilus?*** Length 10 inches. ***Rocky Mountains.***

S. parryi. (RICHARDSON, pl. 10.) Greyish above, pale rust-color beneath; face chesnut-color; ears short; tail flat. Length 16 – 18 inches. ***Hudson's Bay, Behring's Straits.***

S. ludovicianus, Ord. (GODMAN, Vol. 2, p. 114, plate.) ***Prairie Dog.*** Reddish brown above, mixed with grey and black; beneath soiled white. Tail short, banded with brown near the tip. Length 19 inches. ***Missouri.***

GENUS ARCTOMYS. *Linneus. Gmelin.*

Form, habits and teeth of the preceding. Cheek pouches rudimentary. Living in societies. Fore feet with four distinct toes and the rudiments of a thumb; hind feet with five toes, and all furnished with strong hooked and compressed nails. Tail bushy.

OBS. The distinction between this and the preceding genus is exceedingly obscure.

THE WOODCHUCK

ARCTOMYS MONAX.

PLATE XXI. FIG. 4.—(STATE COLLECTION.)

Mus monax. LIN. 12 Ed. p. 81.
Arctomys. GMELIN.
Maryland Marmot. PENN. Arct. Zool. Vol. 1, p. 111.
Arctomys monax. HARLAN, Fauna Amer. p. 158.
Maryland Marmot. GODMAN, Am. Nat. Hist. Vol. 2, p. 100, figure. GRIFFITH, Règne Animal de Cuvier, Vol. 3, p. 170, figure.
The Woodchuck. RICHARDSON, F. B. A. Vol. I, p. 153. EMMONS, Mass. Report, 1840, p. 61.

Characteristics. Adult, reddish grey; head and neck reddish brown; sides of the nose ashy; beneath bright reddish. Tail uniform with the body, its tip slightly darker. Young, rufous, or uniform black.

Description. Body robust and clumsy. Head broad, conical, tapering suddenly to the snout, which is blunt and somewhat truncated. Ears short, broad and rounded as if truncated, two and a half inches apart; hairy within and without. Eyes moderate, black. Whiskers numerous, two and a half inches long; a group of three or four over the eyes, and a more numerous collection on the posterior part of the cheek beneath the ears. Toes well divided and long. On the fore feet the claws are longest, slightly curved, and the one next to the internal longest. Thumb rudimentary, with a small nail. Hind feet semipalmate, with the claws channelled towards the tips, the three middle claws subequal; palms of the fore feet with five tubercles, three in front and two larger behind. On the hind feet, four irregular tubercles at the base of the toes, and two or three unconspicuous ones behind. Length of the soles, 2·5. Tail bushy, sub-distichous, expanded towards the tips. Fur composed of a short wool, and mixed with coarse hairs, which are longest on the foreshoulders and flanks; on the head, chin and feet, short, subrigid and adpressed.

Color, subject to many variations, but the following are most constant: The short fur is dark brown at base, and ferruginous at the tip; through this appear long subrigid hairs, black for two-thirds of their length, and white at the tips. From this results a color which may be designated as reddish grey. On the summit of the head the color is of a uniform shining reddish brown, being ferruginous where it joins the grey of the back; the reddish brown extends beneath the eyes, and within 0·5 of the extremity of the nose. The chin and space around the nose, ash grey; the nose brown. Upper parts of the fore and hind legs and body beneath, deep reddish. Feet covered with blackish brown hairs. Tail resembling in color the upper part of the body, darker towards the end, which is tipped with reddish. From a remarkably fine adult specimen caught in May, and of which we have given a figure, we are enabled to add the following particulars: On the back the hair dark slate at the base, and light rufous at the tips; the longer hairs are black, annulated near the tips with grey; hence results a general dusky grey on the anterior part of the back, the flanks, sides of the neck,

and exterior of the thighs. Summit of the head, spaces round the eyes, and on the rump and tail, dark brown; chin, space around the nose, and a few scattering hairs at the internal base of the ears and over the eyes, grey. Throat, abdomen and superior parts of the extremities with long, shaggy, bright reddish hairs. Feet dark brown, approaching to black. Ears with sparse hairs on both sides, projecting beyond the margins. A few of the black whiskers, and those above the eyes, extend as far as the ears. Tail deep brown, with a shade of dark rufous.

Length of head,	4·5.	Length of fore claw,	0·6.
Ditto of body,	12·5.	Ditto of hind claw,	0·5.
Ditto of tail (vertebræ),	5·5.	Height of ear,	0·6.
Ditto, including fur,	7·3.	Width of ditto,	0·8.
Height,	7·0.	Girth of body,	16·0.

The young exhibit great varieties in their markings. Three apparently not fully grown woodchucks, which I obtained from the hemlock forests about Oneida lake, and which were taken from the same burrow, and measured from 10 – 11 inches in the length of their head and body, exhibited the following appearances:

No. 1. All the upper parts of the body and tail rufous, varied with grey; beneath bright rufous.

No. 2. Uniform jet black above and beneath, except the space surrounding the chin and mouth, which was cinereous grey.

No. 3. Summit of the head, posterior portion of the back and tail dark brownish. Throat, sides of the neck, anterior part of the back, the foreshoulders and flanks, grizzled with long hoary hairs. Beneath, bright fulvous. Tail dark brown above and beneath.

The Woodchuck, or *Ground-hog*, as it is sometimes called, is common in almost every county in the State. In some places it appears to select pine forests for its abode; and in others, it appears to prefer cleared lands and old pastures. It feeds on clover and other succulent vegetables, and hence is often injurious to the farmer. It is said to bring forth four or five young at a litter. Its gait is awkward, and not rapid; but its extreme vigilance and acute sense of hearing prevent it from being often captured. It forms deep and long burrows in the earth, to which it flies upon the least alarm. It appears to be social in its habits; for, upon one occasion, we noticed some thirty or forty burrows in a field of about five acres. These burrows contain large excavations, in which they deposit stores of provisions. It hybernates during the winter, having first carefully closed the entrance of its burrow from within. It is susceptible of domestication, and is remarkable for its cleanly habits. Its cheeks are susceptible of great dilatation, and are used as receptacles for the food which it thus transports to its burrow. Its range, as far as we have been enabled to ascertain, is from Maine to Carolina. It probably extends through the western States.

We have never seen the Quebec Marmot noted beneath, although we have heard that it has been found in this State. We find no specific difference between it and the woodchuck, except in the color. From the description given by Richardson, which is the most recent and complete, it bears a great resemblance to No. 3 noted above.

(*EXTRA-LIMITAL.*)

A. empetra. (Richardson, pl 9.) Hoary above, reddish orange beneath; cheeks whitish. Tail brown and hoary, with a black tip. Size of *monax*. *Northern Regions.*

A. pruinosus. (Richardson, p. 150.) Long coarse fur, especially on the back and shoulders, where it is hoary; hind parts dull yellowish brown. Tail bushy, blackish brown. Size of preceding. *Rocky Mountains.*

A. brachyurus. (Harlan, p. 304.) Above brownish grey tinged with red, and speckled with lighter; nose, feet and under side of body brick red. Tail flat, red above, with a white margin. Length 17·0. Tail 2·5. *Columbia River.*

FAMILY III. GERBILLIDÆ.

Fore feet very short. Hind feet disproportionately long. Tail generally longer than the body. Molars with tubercular crowns, 6 – 8 beneath.

Obs. This forms a small but distinct group, comprising at present about ten species, included under three genera.

GENUS MERIONES. *Illiger.*

Consisting of small species. Tail very long, slender, and nearly naked. Molars beneath six. Fore feet with a rudimentary thumb, with a small nail. Hybernate. Nocturnal.

THE DEER-MOUSE.

Meriones americanus.

PLATE XXIV. FIG. 2.—(STATE COLLECTION.)

Labrador Rat. Penn. Arct. Zool. Vol. 1, p. 132.
Dipus americanus. Barton, Am. Philos. Trans. Vol. 1, p. 114, figure.
D. canadensis. Davis, Lin. Trans. Vol. 4, p. 155, pl. 8, figs. 5 and 6.
Gerbillus canadensis et labradorius. Harlan, Fauna Am. p. 155. Godman, Am. Nat. Hist. Vol. 2, p. 94, figure.
Meriones labradorius. Richardson, F. B. A. Vol. 1, p. 144, pl. 7.
Gerbillus canadensis. Emmons, Mass. Report, 1840, p. 69.

Characteristics. Dark reddish brown above, yellowish on the sides; beneath whitish, tinged with yellow. Length 8·0 – 9·0.

Description. Head narrow, conical, with a small projecting black muzzle covered with short rigid hairs, leaving a naked space about a tenth of an inch wide. Nostrils small, oval and lateral. Mouth beneath. Whiskers long and black, extending to the ears, and even beyond them, with a few scattering hairs before the eyes. Ears suboval, nearly a quarter of an inch long. Eyes very small. Fore feet feeble, 0·5 long, with four white, sharp, com-

pressed straight nails, of which the internal is shortest; a small rudimentary thumb near the base of the inner toe. Hind legs slender, nearly two inches long; the anterior surface covered with short white hair. Tail long, slender, cylindrical, scaly, with short rigid adpressed hairs; slightly enlarged at the base, a few hairs extending 0·3 beyond the tip, which is not, however, tufted. Fur short, not remarkably fine, longest on the posterior parts of the body. Teeth: Incisors, $\frac{2}{2}$; molars, $\frac{3}{6} = 18$. The upper cutting teeth yellowish, and so deeply channelled in the centre as to produce an impression at first that there are four incisors above. The anterior molar above, and the posterior beneath, smallest.

Color. Head dark brown above. Ears margined with fulvous. Space beneath the nose on each side, white. In some specimens this is yellowish, and forms a yellow stripe extending backwards towards the ears. On the upper part of the body a broad dark brown dorsal stripe, becoming yellowish on the sides and whitish beneath. These colors are almost distinctly separated. The dark color of the back is produced by intermixture of numerous black hairs on a fulvous ground. Base of hairs on the head, back and sides slate-colored. The white of the belly not unfrequently mixed with cream-color; and where it unites with the hair on the sides, it is bright rufous. Tail white beneath, separated distinctly from the brown above.

Length of head,	1·0.
Ditto of the body,	2·0.
Ditto of the tail,	5·0.

This curious little animal, although rarely seen, is not uncommon in every part of the State. It was first noticed by Pennant; and subsequently, either this or a closer allied species was described by Zimmerman in 1780, under the name of *Dipus hudsonius*, but we have had no opportunity of consulting his description. For the next notice we are indebted to Dr. Barton, with a figure. Two years afterwards, Davis published a meagre notice, with a figure. Sabine's *labradorius* was drawn up from a mutilated specimen. From the confusion existing in relation to this animal, it appears to be probable that many strongly marked varieties, and, as we have seen, imperfect specimens, have served as the basis for the creation of new species. We refer to our deer-mouse, the notice given by Prof. Peck in the American Philosophical Transactions, Vol. 4, p. 124. The *G. megalops*, *leonurus* and *soricinus*, of a grossly inaccurate and unscrupulous foreign writer in the American Monthly Magazine, p. 446, we consider as mere varieties. A careful and extended comparison of many specimens from various districts will be requisite, before we are enabled to pronounce with certainty upon the existence of more than one species.

The Deer-mouse forms its nest under heaps of stone, or piles of rails, and occasionally, but not often, in stacks of wheat, rye or maize. It brings forth four young, in August. It was called by the Mohegans of this State, *Wah-peh-sous*, or the "animal jumping like a deer." In fact, its leaps of ten to twelve feet at a time are truly remarkable, and have occasioned it to be called the *Jumping Mouse*. In these leaps, it is of course aided by its long tail. We have kept them for some time, when they evinced a timid but gentle disposition,

sleeping during the day, and exceedingly active during the night. They are said to burrow, but their nails appear scarcely fitted for this office; we should rather think that they take possession of vacant burrows, or accidental cavities. They have often been noticed in ploughed grass lands, where the sods of the furrows, by lapping over each other, form long and convenient cavities, in which they make their nests. Mr. Jesse Booth, of Orange county, writes to me, that "in cross-ploughing some years since, my attention was taken up by see-" ing some small thing move off from near my plough, at about the moderate walk of a man. " It went over ridges and descended the hollows of the furrows, bearing some resemblance to " an old withered oak leaf. I pursued it, when it proved to be one of these *wood-mice*, or " *jumping mice;* a female, with four young ones attached by their mouths to its teats." The same gentleman informs me, that "although abundant in his neighborhood, they do very " little damage in the grain fields. They are never seen in the clear daylight, unless dis-" turbed. I once saw two of them," he adds "between sunset and dark, jumping up in " rapid succession, and making a chirping noise like sparrows."

It feeds on the roots of grass, grain, seeds, etc.; but its injuries to man must be inconsiderable. If we are right in supposing all the descriptions as applicable to one species, our Deer-mouse has a considerable geographical range, extending from 62° north to 40°. It has been noticed by Say at the base of the Rocky Mountains.

FAMILY IV. CASTORIDÆ.

Body covered with two sets of hair, a fine soft down and long subrigid hairs. Tail flattened, and covered with rounded or hexagonal scales. Hind feet longest. Ears short. Aquatic. Social. Some species with webbed feet; all with a musky smell, arising from glands near the anus.

GENUS CASTOR. *Linneus.*

Tail broad, oval, flattened horizontally. Molars sixteen. Toes of the hind feet completely webbed. Teats four.

THE BEAVER.

CASTOR FIBER.

PLATE XX. FIG. 1. — PLATE VIII. FIG. 1, A & B. SKULL.

Castor fiber. LIN. 12 Ed. p. 78.
Pond Dog. JOSSELYN, Voyages, p. 92.
Beaver Castor. PENN. Arct. Zool. Vol. 1, p. 98.
C. fiber. Long's Exped. Vol. 1, p. 46. HARLAN, Fauna, p. 122. GODMAN, Am. Nat. Hist. Vol. 1, p. 105, figure.
C. (fiber) americanus. RICHARDSON, F. B. A. Vol. 1, p. 105.
The Beaver. EMMONS, Mass. Report, 1840, p. 51.

Characteristics. Bay or yellowish brown. Length two to three feet. Tail scaly, naked, oval.

Description. Body thick and clumsy, enlarging gradually from the head backwards. Head broad and conical, flattened above. Nose large and obtuse, divided, furnished with strong whiskers. Eyes small and black. Ears short, rounded, and almost concealed in the fur. Neck short and thick. Fore feet small and short, with separate toes; the five claws stout and compressed, the central one longest, the outer and inner shortest. Hind feet with elongated soles; the toes connected throughout their whole length by a stout membrane. Tail broad, flattened, rather pointed at the end, and (except at its origin, where it is furnished for some distance with short hair,) it is covered with sub-hexagonal scales, not imbricated, with a few scattering hairs in the interstices. Incisors very robust, smooth, flat and yellowish in front, rounded and white behind. Molars above directed backward and outward; of the lower jaw, forward and inward. The surfaces of the molars represent elliptical and irregular figures, caused by the foldings of the enamel; they are almost impossible to describe except by figures, and must change with age and continued trituration. The fur consists of two sorts; one composed of long, stiff and elastic hairs, the other of a fine soft down. Glandular sacs containing castoreum, or a strong musky grease or unctuous substance, near the anus.

Color. The long and coarse hair chesnut brown; the downy fur beneath, light plumbeous or silver grey. There are occasional varieties, entirely black, or wholly black or mottled.

Length of head and body, ...	24·0 – 36·0.
Ditto of tail, ...	8·0 – 12·0.

The Beaver, whose skins once formed so important an article of commerce to this State, as to have been incorporated in the armorial bearings of the old Colony, is now nearly extirpated within its limits. The skins of this animal even constituted a certain standard of value, and were a portion of the circulating medium. Thus, in 1697, we find that Governor Fletcher made a certain grant of a tract of land on the Mohawk, and the consideration named in the deed was one beaver skin for the first year, and five annually forever after. According to a letter from the Dutch West India Company, preserved in the Albany Records, we learn, that in 1624, 400 beaver and 700 otter skins were exported; the number increased in 1635, to 14,891 beaver and 1,413 otter skins; and the whole number in the ten years was 80,183 beavers and 7,347 otters, amounting in value to 725,117 guilders. In the same letter, the directors complain that beavers have become exceedingly scarce; having been sold at seven guilders a piece, and even more. One of the earliest legislative enactments by the rulers of the Colony, was in reference to the peltry trade; and I notice in the same records alluded to above, that William De Kay, the ancestor of the writer, was appointed receiver of the duties on beaver and bear skins.

I am informed by Mr. T. O. Fowler, that in 1815, a party of St. Regis Indians from Canada ascended the Oswegatchie river in the county of St. Lawrence, in pursuit of beaver. In consequence of the previous hostilities between this country and England, this district had not been hunted for some years, and the beaver had consequently been undisturbed. The party, after an absence of a few weeks, returned with three hundred beaver skins. These were seen by my informant, who adds that since that time very few have been observed.

In the summer of 1840, we traversed those almost interminable forests on the highlands separating the sources of the Hudson and the St. Lawrence, and included in Hamilton, Herkimer and a part of Essex counties. In the course of our journey we saw several *beaver signs*, as they are termed by the hunters. The Beaver has been so much harassed in this State, that it has ceased making dams, and contents itself with making large excavations in the banks of streams. Within the past year, (1841,) they have been seen on Indian and Cedar rivers, and at Paskungamch or Tupper's lake; and although they are not numerous, yet they are still found in scattered families in the northern part of Hamilton, the southern part of St. Lawrence and the western part of Essex counties. Through the considerate attention of Mr. A. McIntyre, those yet existing in the southern part of Franklin county are carefully preserved from the avidity of the hunter, and there probably the last of the species in the Atlantic States will be found. We noticed the remains of an old and large beaver dam at the outlet of Lake Fourth in Herkimer county, but it is now nearly covered up by the drift sand from the lake.

The Beaver exercises great ingenuity in the construction of its dwelling; but this ingenuity has been much exaggerated, and perhaps no animal has served for the foundation of so many fables. The instinct of self-preservation is doubtless very strong, and its sagacity is such, that were it not for the *signs* near its abode made evident by the stout twigs and trees gnawed and cut down, it would never be discovered. Whenever these chips are noted, the wary hunter proceeds to examine the bank, in order to detect at what particular spot the beaver takes to the water. The castor bags of the beaver, or *barkstone*, as it is termed by the hunters, is then rubbed on twigs near the spot, and a common steel trap is so placed under the water as to spring when the animal dives against it.

The Beaver is strictly a nocturnal animal, and is exceedingly active in its movements. It advances on land by a series of successive leaps of ten or twelve feet, in which it is powerfully assisted by its tail, which it brings down with a resounding noise. It brings forth from two to four at a birth. It feeds chiefly upon the roots of aquatic plants, and the bark of soft-wooded trees, such as the birch, poplar, willow and alder. We have been assured by hunters that they also feed on fish; and for this, their aquatic abodes and habits would appear well adapted. It may be, that in the selection of their dwellings, they design to protect themselves against carnivorous animals.

The geographical range of the Beaver, now so much restricted, once extended from the sixty-eighth to the thirtieth parallel. In the United States, its southern boundary does not extend beyond the districts already mentioned in the State of New-York.

It has been attempted to separate the Beaver of Europe and America into two species. We coincide entirely with Cuvier, who made the most scrupulous comparisons, and was unable to ascertain the existence of any specific differences.

(*EXTRA-LIMITAL.*)

(FOSSIL.)

PLATE XIX. FIG. 3, A, B.

C. (*Trogontherium?*) *ohioense.* This species, which belonged to an animal nearly six feet in length, is founded on the lower jaw of the right side, found near Nashport, Licking county, Ohio, and now in the Zanesville Atheneum. From a cast in the Cabinet of the Lyceum, we are enabled to give the following dimensions: Length, in a straight line, from the posterior part of the lower jaw to the tip of the incisor, 9·5; length of the denuded incisor, following its curve, 9·5; of its bevelled tip, 1·6; breadth of the same, 0·6; breadth of molars, 0·5. The incisor is traversed through its whole length on its anterior and exterior surface, by deep parallel longitudinal grooves. The molars are nearly equal, the penultimate smallest. In some respects, it appears allied to Hystrix. It is, as far as we know, the first instance of the discovery of a fossil of this order in America, and is certainly one of the largest known. In the loose strata near the Sea of Azof in the neighborhood of Taganrok, a skull has been found, which was at first attributed to the Beaver, and which bears a strong resemblance to our specimen. Mr. Fischer has described it as the type of a new genus, which he calls *Trogontherium*, but I have not been able to find his description. For further particulars in relation to the Ohio specimen, see the American Journal, Vol. 31, p. 80, (figure.)

GENUS FIBER. *Illiger.*

Tail long, narrow, pointed and vertically compressed. Molars twelve, the crowns exhibiting sections of triangular prisms. Toes of the hind feet partially webbed. Teats six.

THE MUSQUASH.

FIBER ZIBETHICUS.

PLATE XX. FIG. 2.—PLATE XXXII. FIG. 3. SKULL.—(STATE COLLECTION.)

Castor zibethicus. LINN. 12 Ed. p. 79.
Musk Beaver. PENN. Arct. Zool. Vol. 1, p. 106.
Fiber zibethicus. HARLAN, Faun. p. 132. GODMAN, Am. Nat. Hist. Vol. 2, p. 58, figure. RICHARDSON, F. B. A. Vol. 1, p. 115.
Muskrat. EMMONS, Mass. Report, 1840, p. 54.

Characteristics. Dark brown above, tinged with reddish; greyish beneath. Length eighteen to twenty inches.

Description. Body robust and thickset. Head short, somewhat arched above. Muzzle short and obtuse, with rigid whiskers on each side. Eyes small and black. Ears low, rounded, broader than high, covered with hair, and nearly concealed in the fur. Neck short and indistinct. Fore feet short, with five claws, and covered with short glossy hairs to the bases of the nails, which are short, compressed and slightly curved; the thumb distinct, and furnished

with a long nail. Hind feet long, the soles margined with long whitish hairs; inner and outer toes shortest, subequal; the three others much longer, and the two middle ones united by a short web. Claws moderate, slightly convex, and channelled beneath; a row of stout and coarse bristles on the edges of the toes. Tail vertically compressed, thin on the edges, slightly wider beyond the middle, tapering gradually to its acute tip; its surface is covered with small rounded scales, not concealed by the sparse white hairs. The fur consists of a fine dense down, resembling that of the beaver, but not so fine; this is intermixed with longer subrigid hairs. Upper incisors large, yellowish, slightly rounded, and without grooves; the lower rounded, longer and more pointed. The molars resemble in their structure those of the succeeding family, but have distinct roots.

Color. Dark brown above, intermixed with reddish on the sides of neck and body. Chin, throat and posterior parts of the abdomen greyish or dark ash. Edges of the tail darker than the rest. Occasional varieties are found entirely black, wholly white, or varied with black and white.

Total length, ...	18·0 – 20·0.
Tail alone, ...	7·0 – 10·0.

The Musquash or Muskrat is so called from its strong musky odor, which is secreted from glands near the anus. It is a well-known inhabitant of our swamps and low grounds, and generally in every place in the vicinity of water. Although it establishes its abode often in the vicinity of man, its watchfulness is so great that it often escapes his snares. As might be inferred from its structure, its movements on land are awkward and slow, but it swims and dives with great ease in the water. It is a nocturnal animal, feeding on the roots of aquatic plants, and is said to be particularly fond of the calamus root (*C. acorus*). It is also extremely fond of the fresh-water muscle (*Unio*), heaps of which, in a gnawed and comminuted state, may be found near their retreats. They form extensive holes or burrows in banks, and sometimes build small conical hillocks, in which they live and rear their young. The injuries which they occasion to artificial embankments by their burrows, which gradually render them pervious to water, are well known.

The geographical range of the Musquash is very extensive, being found from 30° to 69° north latitude. From some causes with which we are unacquainted, the Musquash, according to Bartram, is not seen in the alluvial of Carolina and Georgia, although it occurs much further south at a distance from the coast. In this State the skins sell for twenty-five cents apiece, and are extensively used in the fabrication of hats.

FAMILY V. HYSTRICIDÆ.

Clavicles rudimentary or none. Body armed with rigid sharp spines, intermixed with hair. Molars sixteen; their summits flat, with ridges of enamel. Tail various, sometimes armed with spines. Tongue with spiny scales.

Obs. This group, which is founded on the old genus Hystrix, comprises five genera, founded on the predominance of hair or spines, and the shape and armature of the tail.

GENUS HYSTRIX. *Linneus.*

Head robust, short, with an obtuse snout and cleft upper lip. Ears short and rounded. Eyes small. Anterior feet with four toes, posterior with five, all armed with robust curved claws. Spines nearly concealed in the hair. Tail prehensile.

THE NORTH AMERICAN PORCUPINE.

Hystrix hudsonius.

PLATE XXVI. FIG. 1. — PLATE VIII. FIG. 2, a, b, c. Teeth and Skull.

Hystrix hudsonius. Brisson, Regnum Animale, p. 128.
H. dorsata. Lin. 12 Ed. p. 57.
Canada Porcupine. Penn. Arct. Zool. Vol. 1, p. 109.
H. dorsata. Erxleben, p. 345.
H. cristata. Loskiel, p. 84.
Canada Porcupine. Sabine, Franklin's Journey, p. 664.
Erethizon dorsatum. F. Cuv. Mem. Mus. Vol. 9, p. 413.
Canada Porcupine. Cozzens, Ann. Lyc. Nat. Hist. New-York, Vol. 1, p. 190. Godman, Am. Nat. Hist. Vol. 2, p. 150, figure.
Hystrix pilosus. Richardson, F. B. A. Vol. 1, p. 214. Doughty, Cab. Nat. Hist. Vol. 1, p. 211, pl. 21. Griffith, Règne Animal of Cuvier, Vol. 3, p. 206, figure.
Porcupine. Emmons, Mass. Report, 1840, p. 71.

Characteristics. Varying from dull brown to black. Tail moderate, thick, prehensile. Length two to three feet.

Description. Body robust, thickset, with its dorsal outline arched. Head moderate, conic, with the nose truncated, broad, and flattened above. Ears short and rounded, almost entirely hidden in the fur. Eyes small and black. Legs very short, with oval palms on the fore feet; four very short toes, armed with long, curved, compressed, blackish claws, grooved beneath, the outer somewhat the smaller. Hind feet with five subequal claws. Fur long and coarse, especially on the back, sides and posterior parts. The great and striking peculiarity of this animal consists in the quills or spines, which are intermixed with the hair, capable of being erected at the will of the animal, and are so loosely adherent as to be detached upon the slightest touch. These are cylindrical, tapering at both ends to an acute point. They vary

in length from half an inch to three inches, and are white with black tips, or entirely white. When examined with a lens, they are found to be covered with minute barbs, imbricated, and pointed towards the base. On the crown of the head and neck, these are short, thick and numerous; on the shoulders and anterior part of the back, they are few, slender and flexible; on the posterior part of the back, and on the thighs, they are very long, strong and numerous. The upper part of the tail is also furnished with smaller spines. The young have long white hairs in place of spines.

Teeth. In the upper jaw, the incisors are very strong, flattened in front abruptly, and bevelled behind; the portion within the sockets three-sided, nearly two inches long, describing the segment of a circle nearly two inches in diameter; the bottom of the socket reaches beneath the socket of the posterior molar. The first, third and fourth molars nearly equal, the second smallest. The anterior molar with three large and irregular diverging prongs, of which the internal is broad and largest; the crown with five cavities separated by waving plates of enamel, the posterior exterior cavity smallest, oval. The second molar small, with four cavities on the crown, resembling in shape the two posterior molars; but the internal oblique cavity becomes gradually effaced in the posterior molar, by the absence or rather subsidence of the internal wall. The fangs of this second molar are also three in number, with a tendency in the two outer to become double; in the two last, the prongs are increased to three. In the lower jaw, the incisors are 2·7 long, and reach beneath the root of the posterior molars; they project farther from the jaw than those of the upper jaw, and describe an arc of a larger circle; the bevelled portion is also much longer. The molars are similar in size and configuration above, except the second, which is smaller. They have all four cavities, three of which are regularly bounded by plates of enamel, and the external cavity deficient on its outer margin. The anterior molar with three prongs, of which the anterior is largest; the whole periphery of the crowns surrounded by a plate of enamel, including the plates which bound each cavity. With age, the whole surface is ground down, leaving no vestige of cavity. The molars of the upper jaw incline outwards; of the lower, inwards.

Color. Usually dark brown, intermixed with black; the females are said to be of a darker brown. They are often hoary, and occasionally entirely white. The tail is brown above and beneath, with a few whitish hairs along its margin and at its tip.

Length of head and body,	24·0.
Ditto of the tail,	6·0.
Ditto of the skull,	4·0.

The Porcupine is an inoffensive animal, and very gentle in its manners. It feeds on the leaves and bark of the hemlock (Pinus canadensis), the basswood (Tibia glabra), and the ash (Fraxinus sambucifolia). It is also fond of sweet apples, maize, and will scarcely refuse any vegetable offered to them in confinement. They move very sluggishly, dragging their tail on the ground. When irritated, they make a faint whining noise, and by a strong cuticular muscle the spines of the back and sides are erected and extended in various directions; the tail

is also erected, and by a very sudden movement he is enabled to strike, leaving the loosened spines in the body of his opponent. From their peculiar structure, they penetrate at every movement until they reach a vital part. Hence it is rarely attacked, although the hunters easily kill it by a blow on its nose. The Indians esteem its flesh, which resembles young pork very highly. It dwells in hollow trees, or in caves under rocks, and is said to bring forth two at a litter in April or May. The spines are employed extensively by the Indians, after having been dyed of various colors, to form ornaments for their dresses.

The Porcupine is found as far north as 67°. It is found in all the Northern States; in New-York, Pennsylvania, the northern parts of Virginia, Kentucky, and through the western regions to the Rocky Mountains. In this State, more particularly in the northern and western counties, they are quite numerous. The first name given in accordance with the binary system, is that proposed by Brisson, and by the law of priority it must be restored.

FAMILY VI. MURIDÆ.

Clavicles robust, and fully developed. Fur not uniformly soft, but without spines or rigid hairs. Molars usually six above and six beneath, but various. Some of the genera are provided with cheek pouches. Tail cylindrical, usually naked or sparsely haired, of various lengths. Mostly composed of small burrowing animals.

This family comprises numerous species, which are confessedly difficult to group together by common characters. They may, however, be divided into two great sections, characterised by the presence or absence of cheek pouches. Under those with cheek pouches, we arrange the genera *Geomys* and *Diplostoma*. The other division embraces the genera *Mus*, *Arvicola*, *Sigmodon*, *Neotoma*, *Georychus*, and *Aplodontia*. The field for discovery in this family is still far from being exhausted. The representatives of only three genera are found in this State.

GENUS MUS. *Linneus.*

Molars six above and six beneath, with tuberculous summits. Tail scaly, nearly naked, longer or nearly as long as the body. Ears usually naked or slightly furred.

Obs. Three of the species have been introduced.

THE BROWN RAT.—(*Introduced.*)

Mus decumanus.

Mus decumanus. Pallas.
Brown Rat. Penn. Arct. Zool. Vol. 1, p. 130.
Common Brown or *Norway Rat.* Gooman, Am. Nat. Hist. Vol. 2, p. 78.
Brown Rat. Richardson, F. B. A. Vol. 1, p. 141. Emmons, Mass. Report, 1840, p. 63

Characteristics. Grayish brown above, tinged with yellow; beneath whitish. Tail not quite as long as the body, and with 180 rings. Length 19 – 20 inches.

Description. Body robust. Ears rounded, as broad as long, and nearly naked. Eyes black, large and prominent. Tail naked and scaly, with a short hair under each ring; it is sometimes as long as the body, but usually shorter.

Color. Hair dusky ash at the roots, yellowish with a reddish tinge at the tips, intermixed with longer hairs of a uniform brown, from which results a yellowish gray brown color above. Beneath, soiled white, inclining to cinereous. Feet pale flesh-color.

Length of head,	2·5.
Ditto of body,	9·0.
Ditto of tail,	8·5.

This well known and dreaded pest of our dwellings came originally from Asia. It appeared in Europe about the beginning of the seventeenth century. It is believed to have been imported into England with its Hanoverian race of kings. In this country, it was introduced with the foreign mercenaries during the revolutionary war. They are now numerous in all the States, and have extended to Canada. It takes to the water, and swims with great ease. In cities it infests the wharves, and hence is frequently known as the *Dock Rat.* The name *decumanus*, we apprehend, was not given on account of its size (*decimanus*), but from *decumanus*, in allusion to the tithe of every thing taken by this voracious animal. (See *Cicero contra Verres.*)

The Rat is a bold, voracious and cunning animal, and appears to be as fond of flesh as of vegetables. It brings forth twelve to sixteen at a litter. The best mode of destroying them is said to be, mixing plaster of paris largely with dry flour; this will harden in the stomach, and destroy them in a short time. Another mode is to mix powdered nux vomica with indian meal, and add a few drops of oil of rhodium to the mixture. Arsenic is frequently employed, but is objectionable on account of the fatal accidents to which it frequently gives rise.

THE BLACK RAT.—(*Introduced.*)

MUS RATTUS.

Mus rattus. LINN. 12 Ed. p. 83.

Black Rat. PENNANT, Arct. Zoology, Vol. 1, p. 129. HARLAN, Fauna Americana, p. 148. GODMAN, Am. Nat. Hist. Vol. 2, p. 83. RICHARDSON, F. B. A. Vol. 1, p. 140. EMMONS, Mass. Report, 1840, p. 63.

Characteristics. Greyish black above; ash-colored beneath. Tail somewhat longer than the body. Length 15 – 16 inches.

Description. Head long; muzzle more acute than in the preceding species; lower jaw very short. Ears oval, broad and naked, nearly half as long as the head. Whiskers long. Fore feet with four toes, and a claw in place of thumb. Tail longer than the body, and covered with scales in the form of rings. Feet plantigrade. Mammæ twelve.

Color. Deep iron-grey or greyish black above; lighter beneath, usually cinereous. Feet and tail dusky, with white hairs covering the tops of the feet.

Length of the head,	1·5.
Ditto of body,	5·5.
Ditto of tail,	7·9.

This animal is also supposed to have originally been derived from Europe, and thence transmitted to America. It is smaller than the preceding, and is generally thought to have disappeared before it; at any rate, it is now exceedingly rare. It is said to breed several times in the year, producing from six to twelve at a litter. Like the preceding, it is omnivorous.

THE AMERICAN BLACK RAT.

MUS AMERICANUS.

PLATE XXI. FIG. 1.—(COLLECTION OF J. G. BELL.)

Characteristics. Black above, leaden beneath. Ears higher than broad. Tail shorter than the body. Length 15 inches.

Description. Ears large, dilated and rounded, almost entirely naked, sparsely furnished with short hairs. Whiskers black, numerous, extending to the hind head. Fore feet feeble, with five tubercles on the soles. Claws horn-colored, small, acute, incurved; the toe next to the internal longest. Hind feet with four tubercles arranged quadrilaterally; toes longer and more robust than on the fore feet; claws stouter, and not so much incurved. Muzzle bifid. Nostrils lateral. Tail cylindrical, tapering regularly to the tip: the annulations about a hundred and forty, covered sparsely with short hairs, which extend 0·2 beyond the tip.

Teeth. In the lower jaw, the incisors are longer than those above. The molars gradually diminish in size; the first largest, with two cavities; the anterior trilobate in front, and separated by a waved transverse ridge from the adjacent tooth; the second with two smaller cavities, separated in the same manner. The posterior tooth smallest, with two cavities, the ultimate space rounded.

Color. Above uniformly black, the fur at the base slightly fulvous; beneath, of a uniformly leaden hue. Incisors yellowish. Fore toes whitish, with a rufous tinge on the inside.

Length of head,	2·4.	Height of ear,	0·75.
Ditto of body,	7·0.	Width of ditto,	0·45.
Ditto of tail,	6·0.	Girth of body at shoulders,	7·00.

We cite no synonimes, as we believe the species to have been either unobserved, or confounded with the imported Black Rat of Europe. It is very rare. The only specimen I have ever seen was brought to me in a recent state by Mr. John Bell, when the fur was distinctly black. After having been mounted for several months, the fur assumed a more brownish hue. It appears to differ from the *decumanus* in its teeth, the number of its annulations, position of the mouth, and proportion of its ears; from the *rattus*, in its dentition, relative length of ears, and tail.

THE COMMON MOUSE.

MUS MUSCULUS.

Mus musculus. LIN. 12 Ed. p. 83.
Mouse. PENN. Arct. Zool. Vol. 1, p. 131. SAY, Long's Exped. Vol. 1, p. 262. HARLAN, p. 119. GODMAN, Am. Nat. Hist. Vol. 2, p. 84. EMMONS, Mass. Report, 1840, p. 62.

Characteristics. Dusky grey above, with a slight tinge of yellow; beneath ash grey. Ears about half the length of the head. Tail nearly as long as the body.

This familiar little species has also been introduced from Europe into this country, since its discovery. It has every where followed the footsteps of man, and is now extended to our most western settlements. It breeds several times, or what is more probable, at various seasons of the year, bringing forth from six to ten at a litter. It may be treated rather as a troublesome than as an extensively injurious animal. It is omnivorous, and lives equally on flesh and vegetables; apparently, however, preferring the latter.

THE JUMPING MOUSE.

MUS LEUCOPUS.

PLATE XXIII. FIG. 1.—(STATE COLLECTION.)

The Rustic Mouse. GODMAN, Am. Nat. Hist.
Mus leucopus. RICHARDSON, F. B. A. Vol. 1, p. 142.
Arvicola emmonsi. EMMONS, Mass. Report, p. 61.

Characteristics. Brownish above; feet and all beneath white. Ears large. Tail hairy, as long or longer than the body. Length six inches.

Description. Head rather large, with a pointed muzzle. Eyes moderate. Ears large, rounded above, membranous and naked on the upper margin within and without. Whiskers numerous, blackish brown at the base, whitish at the tips, longer than the head. Fore feet four-toed, with five tubercles; the thumb is rudimentary, not furnished with a claw. Hind feet an inch and a half long, with five toes, and with short, feeble and curved claws nearly concealed by long white hairs. Tail slender, hairy, subquadrate, slightly tapering. Incisors not grooved. Molars tuberculated, the first in each jaw largest; they gradually diminish in size to the most posterior, which, when worn, presents a circular disk on the crown, and is scarcely tuberculated. Fur fine and rather long.

Color. Light reddish brown above, intermixed with some entirely black hairs along the back, which gives to that region a much darker appearance. The light reddish fur above is dark slate at the roots; it is separated from the light color beneath by a tolerably well defined, and occasionally a darker line. All beneath, including the feet, the anterior, inner and posterior parts of the thighs, and the inferior and lateral portions of the tail, pure white. This color is plumbeous at the base.

Total length,	6·0.	Length of hind feet,	1·5.
Length of head,	1·0.	Ditto of whiskers,	1·5.
Ditto of body,	2·5.	Ditto of tail,	2·5.
Ditto of fore feet,	0·8.		

This little mouse, from the distribution of its colors, and its slender proportions, has a delicate and beautiful appearance. It is very agile, jumping in the manner of the deer-mouse; and is called, in common with that animal, the *jumping mouse*. It seems to prefer forests and wooded places, but is often found in meadows or cultivated grounds, where grain and seeds of grasses abound. When this mouse was first submitted to me, I referred it to the *M. agrarius* of Godman; but upon consulting the original description, it was plainly evident that it could not be referred to that species, although Godman evidently had the jumping mouse in view when he drew up his description.* I had not at that time the work of Richardson to refer to, and hastily pronounced it to be new, giving it the name of *emmonsi*, after the eminent naturalist who had first brought it to my notice.

The Jumping Mouse is found in every part of the State, and is said to build its nest in trees. In the northern regions, according to Richardson, it becomes an inmate of the dwellings at the fur establishments, and makes hoards of grain in various places, such as the pocket of a coat, a shoe, etc. We have never heard of its entering dwellings in the cultivated portions of our State, but this is probably owing to the presence of the cat, or of rats. It is found from Hudson's Bay to Pennsylvania, and through the Western States to the mouth of Columbia river.

GENUS ARVICOLA. *Lacépède.*

Grinders flat on their crowns, the enamel forming angular ridges on the surface. Ears furry. Tail round and hairy, shorter than the body.

Obs. This genus, which was first separated from *Mus* by Lacépède, comprises many species known under the vague names of Field Mice and Field Rats; all, however, differing from the Mice proper, by the structure of their teeth, and the length and hairy covering of the tail. The species are numerous in the United States, but have not yet been sufficiently observed and discriminated.

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* According to Erxleben, p. 398, the *agrarius* has small ears, a constant black line on the back, the thumb with a nail, tail half the length of the body, etc.

THE MARSH MEADOW-MOUSE.

ARVICOLA RIPARIUS.

PLATE XXII. FIG. 2.—(STATE COLLECTION.)

Arvicola riparius. ORD, Acad. Sc. Philad. Vol. 4, p. 305.
Marsh Campagnol. GODMAN, Am. Nat. Hist. Vol. 2, p. 67.

Characteristics. Glossy, tawny brown above; light plumbeous beneath. Tail less than half the length of the head and body. Length three to three and a half inches.

Description. Body short and robust, more particularly about the shoulders. Head large. Muzzle elongated, truncate at its extremity. Eyes distinct, and 0·3 distant from the end of the muzzle. Mouth beneath, not terminal. Whiskers numerous, white, and 0·6 long. Ears distinct, broad, subacute, and lined within and without with long hairs extending beyond the margins; this, together with the long fur surrounding them, almost conceals them from observation. All the feet very short and slender. Fore feet 0·6 long, and clothed with short adpressed hairs; the claws small, acute, curved, channelled beneath, and dilated at their bases; the thumb rudimentary, and furnished with a short triangular claw; the two middle toes longest, subequal. Hind feet placed very far back, 0·8 long, and clothed with short rigid adpressed hairs, extending to the tips of the nails; the three middle toes subequal. Tail very slender, equal throughout, subquadrate, not flattened, scaly, with short hairs scarcely concealing the scales, and extending about 0·2 beyond the vertebræ; not forming, however, a tuft, as is erroneously given in the plate. Fur rather fine and soft, 0·2 long on the upper part of the body. The nose, jaws and chin furnished with short hair.

Teeth. The upper incisors short, scarcely higher than broad; their flat, chisel-shaped points directed towards each other, and their bases somewhat diverging. The lower incisors slender, 0·13 in length above their sockets, cylindrical, pointed, and directed forwards horizontally. The anterior and posterior molars smallest, and all with zigzag lines of enamel; the middle molar is composed of four flattened prisms.

Color. Above a glossy tawny brown, plumbeous at the base, intermixed with others longer and totally black. Chin and all beneath, leaden grey. Feet dark brown; soles black. Tail deep blackish brown, imperceptibly passing into a shade lighter beneath.

Length of head and body,	2·5.
Ditto of tail,	0·7.
Total length,	3·2.

The *Bank Meadow-mouse* of Richardson, which he refers to the *riparius* of Ord, I cannot think is identical with it. It is much larger, being nine inches in total length, and has white feet and a flattened tail. The very small size of the specimen which I first obtained, and from which the dimensions given above were taken, induced me to suspect that it was new; but later observations on others have satisfied me of its identity with the *riparius*. Mr. Ord gives

the length of the head and body, five inches; of the tail, two inches. He states that the female has four pectoral and four abdominal teats, and brings forth eight young at a litter. It frequents marshy places, living chiefly on the seeds of plants growing in such localities. It burrows in the banks for its retreat, and for rearing its young.

The Marsh Meadow-mouse is not uncommon in various parts of the State. I have seen specimens from Oneida, Seneca and Otsego counties. At present, it is known to extend from Delaware Bay to the forty-third degree of north latitude, and it will probably be found in all the Eastern States.

THE TAWNY MEADOW-MOUSE.

ARVICOLA RUFESCENS.

PLATE XXII. FIG. 1.

Characteristics. Light reddish brown above; slate beneath. Tail longer than the head. Length 6 – 7 inches.

Description. Body robust. Head large, conical, with an arched forehead. Nose bluntly pointed; nostrils bilobate, subterminal, and beset with short, erect and rigid hairs. Mouth beneath, the upper lip fringed with short white incurved hairs, and on the cheeks are long white bristles. Whiskers as long as the head, brownish, and occasionally whitish at the tips. Eyes small and black, nearly equidistant between the ears and muzzle. Ears large, much dilated and rounded, covered with long hairs extending beyond the margins. The fur anterior to the ear is very long; and when the ears lie back, although large, they are nearly concealed in the fur. Fore feet very slender, 0·8 long, with four separated slender toes, and a rudimentary thumb furnished with a small nail. Soles with five tubercles, three arranged in a triangle, and the two others transversely. Claws curved and retracted at their tips; external toe shortest, the second longest, the two middle subequal. Hind feet placed far back, 1·1 in length; the internal toe shortest, almost rudimentary, and the claws more broadly channelled throughout their entire length. Soles with six tubercles, the external very small. Tail very slender, subquadrate, slightly tapering, with sparse rigid hairs scarcely concealing the scales; tip moderately pencilled, not tufted. Fur on the body very soft and glossy, for the most part 0·3 in length; the legs are clothed with short adpressed hair, a few white hairs extending to the tips of the claws. Upper incisors broad, convex anteriorly, with a medial longitudinal furrow, slightly emarginate on their cutting edges; beneath they are more cylindrical, and pointed at their tips. Upper molars with nine external angles; beneath, the first is largest, with a deep lateral sinus.

Color. The fur on the upper part of the head and body is plumbeous at base, light rufous at the tips, intermixed with scattering coarse hairs tipped with black; hence the resulting color is a bright reddish brown. Beneath, bluish white, somewhat more light on the inside of the thighs. Muzzle, and the parts adjacent, of a darkish brown hue. Feet light brown. Tail of a uniform dark brown above, cinereous beneath.

Total length,	5·0.
Length of head and body,	3·0.
Length of tail,	2·0.

It is with hesitation that I venture to consider this animal as new. It will be found to differ from *riparius* by its larger and more arched head, and its dental structure; from *xanthognathus*, to which it bears some resemblance, by its relative dimensions; from *noveboracensis* of Richardson, by the blunt nose and rudimentary thumb; and from *borealis*, by its nearly naked tail, and comparatively shorter fur. It only remains for us to consider it under a new name, at the hazard of swelling the already interminable list of synonimes.

We have little to add, except that it was first obtained from low grounds in the neighborhood of Oneida lake. I subsequently found it in great numbers in the forests of Hamilton and St. Lawrence counties. It was exceedingly active and lively, and frequently seen running along on fallen timber. When disturbed, it retreated to its burrow at the roots of trees. It may be added, that variations in the length of its tail frequently occur. In specimens of the dimensions given above, the tail varied from one and a half to two inches.

THE BEAVER FIELD-MOUSE.

ARVICOLA HIRSUTUS.

PLATE XXV. FIG. 2.—(STATE COLLECTION.)

Meadow-mouse. PENNANT, Arct. Zool. Vol. 1, p. 133.
Arvicola hirsutus. EMMONS, Mass. Report, 1840, p. 60.

Characteristics. Dark brown above, deep ash beneath. Tail less than half the length of the body. Ears membranous, concealed. Length five to five and a half inches.

Description. Body robust, compact, largest across the fore shoulders, sensibly less over the loins. Head pyramidal. Whiskers numerous, scattering, radiated, black and white, some of them extending beyond the eyes. Nose flesh-colored, cleft, and covered to its tip with short rigid hairs; nostrils lateral. Eyes small and black, almost hidden in the fur, and about half an inch from the nose. Ears large, round, membranous, concealed beneath the fur, apparently naked behind, but in fact sparsely furnished with hairs which extend beyond the margins; within naked, except towards the edges; auricular opening large, and presenting a tripartite cavity. Anterior to the ears, the fur is so long, and unites so well with that on the borders of the ears, that although they are in fact quite large, they are not obvious; they are distant about an inch and a half from the extremity of the nose. Tongue smooth and fleshy, with a longitudinal furrow. There is a reduplication of the skin posterior to the upper incisors, which is furnished with hairs. Three transverse furrows anterior to the molars. Fore feet 0·8 long, with four toes, and a thumb furnished with a minute nail; the remaining toes have white, compressed, pointed claws, deeply channelled beneath; the external shortest, the two middle ones subequal, the one nearest the thumb being somewhat longest: all the toes with transverse

scales beneath. Soles with five tubercles. Hind legs 1·2 in length; the internal toe shortest, and the middle toe slightly longer than the adjacent one on each side; near their bases, the nails are slightly tinged with brown: all the toes have transverse scales on the under side. Soles with five distinct tubercles, and another minute one opposite the internal toe. Tail moderate, cylindrical, enlarged at the root, scaly, with rather sparse supine hairs, some of which extend slightly beyond the vertebræ. The whole body covered with an exceedingly long and fine fur, standing half an inch high along the back, and slightly less on other parts of the body. On the legs the hairs are short, adpressed beneath, and extend beyond the nails.

Teeth. These correspond very well with the dentition assigned by Fred. Cuvier to the Campagnols, (Dents des Mammifères, p. 155,) with the following variations: The second molar of the upper jaw is composed of five triangles, the posterior space being the largest, elongated and sinuous. In the lower jaw, the incisors are not as much rounded on their anterior surfaces, are more slender, and twice the length of those above. In the first molar are three internal triangles, of which the posterior is largest; in the second are an anterior, an external, two internal, and a posterior transverse space; the last molar has three irregular spaces, the posterior being the largest, transverse and almost semilunate. All are so closely united, that a casual observer would be led to suppose that there were many more teeth than actually exist. In the broad and dilated processes of the lower jaw, almost concealing the teeth, and in the position and shape of the triangular spaces on the crowns of the teeth, we have a representation in miniature of similar parts in the *Fiber zibethicus* already described.

Color. Above brownish grey, slightly darker on the back, approaching nearly in color to the Brown Rat. This color passes into slaty grey on the chin, cheeks and abdomen; the base of the fur, on every part of the body, dark plumbeous. Feet dark brown above, cinereous beneath. Nose flesh-colored. Tail brownish above, lighter beneath, with a few hairs fulvous at their base.

Length of head and body,	5·0.
Ditto of tail,	1·9.

In another specimen the dimensions were,

Length of head and body,	3·9.
Ditto of tail (vertebræ),	1·4.
Ditto ditto (including fur),	1·6.

This species affords another example of the great difficulty of determining whether it has been previously described. A distinguished American naturalist is disposed to refer it to the *xanthognathus* of Leach, (Zool. Miscell. Vol. 1. pl. 26.) It wants, however, the fulvous cheeks, and the ears well covered with hair, attributed to that species by Richardson. Upon the suggestion that it might possibly be the *pensylvanicus* of Ord and Harlan, it was shown to both those gentlemen, who pronounced it to be totally distinct. We are inclined to believe it to be the Meadow-mouse of Pennant, as cited above. His account, concise as it is, agrees

with our species, except in the very variable and ill-defined character of pencils of hairs on the tail. Richardson appears to doubt whether Pennant was not mistaken in the length of the tail. He quotes Buffon with a doubt, but he also refers to a specimen in the Leverian Museum, from which he probably drew his description. It is very closely allied to the *pensylvanicus* of Ord, as described by Richardson.

The popular name of *Beaver Rat* or *Beaver Mouse*, is derived from the abundance and fineness of its fur. I am unacquainted with its habits, except that it appears to be nocturnal, and quite gentle. It feeds on various grains and shrubs. It is occasionally eaten, and is said to be delicate food. It occurs in various parts of the State, and I have received specimens also from Connecticut.

THE ONEIDA MEADOW-MOUSE.

ARVICOLA ONEIDA.

PLATE XXV. FIG. 1.—(STATE COLLECTION.)

Characteristics. Amber brown above, dark cinereous grey beneath. A triangular thumb claw. Hind feet very long. Length 3 – 4 inches.

Description. Body moderately robust, and covered with a fine soft fur about 0·2 in length. Ears placed very far back, membranous, and nearly hidden in the fur. Eyes moderate and black. Muzzle pointed, bifid, truncated, and covered with short rigid hairs. Nostrils lateral. Whiskers slender, black, not as long as the head; numerous black setæ over the eyes. Upper lip fringed with short, recurved, rigid hairs. Feet very small and slender, not formed for digging, covered with short adpressed hairs; the nails covered with long hairs. Fore feet with four slender, separated toes, furnished with short nails, broad at the base, very acute, compressed and channelled beneath; thumb small, and furnished with a short triangular nail. Hind feet nearly twice the length of the fore feet, the fur concealing more than two-thirds of the tibia; five-toed, the toes somewhat longer, and the nails slightly stouter, but broadly channelled beneath, and not so much incurved as those on the fore feet; inner toe shortest, the three next subequal, the outer longer than the inner toe. Tail slender, subequal throughout, sparsely covered with rigid adpressed hairs; the articulations not concealed, and slightly pencilled at the tip. Upper incisors very short.

Color. Above brown or dark mouse-color, with a slight intermixture of tawny. At the base the fur is dark slate, and on the upper part of the head and body, and on the sides, with tawny tips; mixed with these are longer and uniformly black hairs. Incisors yellow. Muzzle and chin ashen gray. Beneath, the fur is light slate at the base, grey at the tips, from whence results a general light blue grey beneath. Feet with short, stiff, uniform brownish black hairs. Nails light horn marked with brown.

Total length,	4·5.	Length of fore legs,	0·4.
Length of tail,	1·3.	Ditto of hind legs,	0·7.
Ditto of head and body,	3·2.		

This species is common in the western part of the State. My specimens were obtained from the neighborhood of Oneida lake. It appears to prefer moist places.

THE LIGHT-COLORED MEADOW-MOUSE.

ARVICOLA ALBO-RUFESCENS.

PLATE XXIV. FIG. 1.—(COLLECTION OF PROF. EMMONS.)

Arvicola albo-rufescens. EMMONS, Mass. Report, 1840, p. 60.

Characteristics. Light yellowish above, lighter beneath. Length five inches.

Description. Body compact. Head conical, moderate, with a slightly convex outline. Muzzle prominent, and furnished on each side with two series of light brownish bristles, extending as far back as the ears. Eyes small and black. Nostrils lateral, with a dividing furrow. Ears membranous, large and rounded, with hairy margins and a broad auditory opening. Fore feet feeble, and clothed with short subrigid hairs extending to the tips of the nails, with a thumb tubercle, furnished with a rudimentary nail. All the nails nearly straight, slightly incurved. Hind feet longer, and clothed in the same manner with short hairs; five-clawed, the three medial subequal. Tail slender, scaly, sparsely covered with rigid hairs, a few of them extending 0·15 beyond the tips. In cabinet specimens, the desiccation of the tail gives it a somewhat nodulous appearance. Upper incisors short, yellow, and convex in front; lower incisors long and rounded. Upper molars broad and angular in front, narrow and more rounded behind. In the lower jaw, the anterior molar is composed of six plates of enamel; the middle, of four; and the posterior, which is smallest, of three plates.

Color. All the upper part of the head and body, and the sides, drab, with a tinge of reddish; beneath greyish, with a tinge of sulphur yellow. All the fur white at base. Feet and tail brownish, the latter cinereous beneath.

Length of head and body,	3·08.	Length of fore legs,	0·6.
Ditto of tail (vertebræ),	1.03.	Ditto of hind legs,	1·0.
Ditto of ears,	0·25.		

For an opportunity of examining this animal, I am indebted to Prof. Emmons, who obtained it on its form or nest, with another of the same shape and color. The color of its eyes renders it probable that it was not an albino. It appears to be very rare.

THE YELLOW-CHEEKED MEADOW-MOUSE.

ARVICOLA XANTHOGNATHUS.

PLATE XXIII. FIG. 2.—(STATE COLLECTION.)

Arvicola xanthognathus. LEACH, Zool. Miscell. Vol. 1, p. 60, pl. 26.
Campagnol aux joues fauves. DESM. Mammalogie, p. 282.
The Meadow-mouse. GODMAN, Am. Nat. Hist. Vol. 2, p. 65.
Yellow-cheeked Meadow-mouse. RICH. F. B. A. Vol. 1, p. 122.

Characteristics. Reddish brown above, greyish beneath; cheeks fulvous. Tail not as long as the head. Length 8 to 10 inches.

Description. Body robust, cylindrical. Ears half an inch high in the largest individuals, rounded, sparsely hairy within, well furred externally. Whiskers numerous, longer than the head. Muzzle somewhat blunt. Fore legs covered with short adpressed hairs, a few extending beyond the nails; four toes, and a vestige of thumb with a nail; the other nails are slightly curved and feeble. Hind feet five-toed, the three middle subequal. Tail slender, slightly less at the tip, covered with numerous adpressed hairs, concealing the scales, and forming a point 0·2 beyond the tip. Incisors above short, rounded in front. In the upper jaw the posterior molar largest; below, the largest is the anterior molar. Fur long and soft.

Color. Above, reddish brown, intermixed with uniformly black hairs; beneath, bluish ash. Sides of the cheeks reddish, more or less distinct. Upper part of the feet and tail dark reddish brown, ashen grey or whitish beneath.

Length of head and body,	7·0.
Ditto of tail,	1·3.

This Meadow-mouse is found in various parts of the State. It varies much in size; and Godman, who assigns five inches for its length, probably described from a young individual. It burrows in banks, and produces seven or eight at a litter. Its geographical range is extensive. It occurs in the Western States, and extends to the Arctic regions.

(*EXTRA-LIMITAL.*)

A. pensylvanicus, Ord. (RICHARDSON, p. 124. WILSON, Orn. Vol. 6, pl. 50.) Brown above, beneath nearly white; snout obtuse. A blunt hairy tail, half the length of the body. Length 4–5 inches.

A. borealis. (RICHARDSON, Zool. Mag. 1828.) Above chesnut mixed with black, grey beneath; a strong thumb nail; ears concealed in the head. Tail as long as the head. Length $5\frac{1}{2}$ inches. *Arctic Regions.*

A. noveboracensis. (RICHARDSON, p. 126.) Above dark brown, beneath dark grey; nose acute, slender; ears slightly beyond the fur. Tail scaly, sparsely hairy, more than half the length of the head. Length 6 inches. *Rocky Mountains.*

A. nuttali. (HARLAN, Med. and Phys. Res. p. 55, plate.) Fawn color above, white beneath; ears large and hairy. Tail nearly as long as the body. Length 5½ inches. *Virginia.*

A. pinetorum. (LE CONTE, Ann. Lyc. Vol. 3, p. 132, plate.) Dark ash, tipped with brown; ears short, naked, concealed; thumb with a straight nail. Tail round, 0·7 long. Length 3 to 4 inches. *Georgia.*

A. gapperi. (Zool. Journ. Vol. 5, p. 202.) Tail more than half the length of the body; ears short, rounded, chesnut above; face and sides yellowish brown; belly yellowish white; chin and throat ashen. Tail nearly two inches. Length six. *An neoboracensis?*

A. ferrugineus. (HARLAN, Med. and Phys. p. 57.) Rust-colored above, white beneath; fore legs short. Tail more than half the length of the body. Length 11 inches. *Mississippi.*

A. richardsoni, (*riparius* of Richardson, p. 120.) Dull brown mixed with black, bluish grey beneath; ears moderate, nearly concealed. Tail flat, as long as the head; feet white. Length 9 inches. *Arctic Regions.*

A. rubricatus. (Beechey's Appendix.) With a bright red stripe on the flanks. *Behring's Straits.*

Genus NEOTOMA, *Say* and *Ord.* Molars with large roots; the folds of the enamel not descending as low as the edge of the alveolar processes. Its other characters similar to the genus Arvicola.

N. floridanum. (Ac. Sc. Vol. 4, p. 345, pl. 21.) Plumbeous above, yellowish on the sides; eyes and ears very large. Tail longer than the body. Length 14 inches. *Florida.*

N. drummondi. (RICHARDSON, pl. 7.) Yellowish brown above, white beneath. Tail more bushy towards the extremity, longer than the body. Length 16 inches. *Rocky Mountains.*

Genus SIGMODON, *Say.* Molars subequal, with roots; the folds of the enamel representing the letter S.

S. hortense. (HARLAN, Med. and Phys. pl. Ac. Sc. Vol. 4, pl. 22.) Soiled yellow or blackish above, beneath cinereous; ears large and round. Tail nearly as long as the body. Length 10 inches. *Florida.*

Genus GEORYCHUS, *Illiger.* Eyes very small; ears rising slightly above the auditory hole; thumb obvious; toes of the fore feet formed for digging. Tail very short.

G. helvolus. (RICHARDSON, p. 128.) Head black and tawny; body reddish orange, paler beneath. Length 5 inches. *Northern Regions.*

G. trimucronatus. (RICHARDSON, p. 130.) Chesnut above; thumb nail with three projecting points. Length 5½ inches. *Arctic Regions.*

G. hudsonius. (ID. p. 132.) Dark brown above, bright rusty on the sides; the two middle nails of fore feet very large, with a deep notch on the ends; earless. Length 6 inches. *Labrador and Arctic Regions.*

G. grænlandicus. (ID. p. 134.) Earless; a dark dorsal stripe; nails of the fore feet terminating in sharp cylindrical points. Length 7 inches. *Arctic Regions.*

Genus APLODONTIA, *Richardson.* Molars ten above, eight beneath; ears short and round; feet five-toed; nails large, strong and compressed. Tail minute, concealed by the fur.

A. leporina. (RICHARDSON, p. 211, pl. 18.) Umber brown above, greyish beneath; legs short; throat with a white spot. Tail ½ an inch. Length 14 inches. *Northern Regions, Missouri.*

** WITH CHEEK POUCHES.

Genus GEOMYS, *Richardson.* Eyes small and far apart; auditory hole small, with a slightly raised margin; molars ten above, ten beneath; cheek pouches large and pendulous, opening into the mouth by the side of the molar teeth. Burrowing.

G. douglasi. (RICHARDSON, pl. 18.) Dusky brown above, paler beneath. Tail more than half the length of the body. Length nine inches. *Columbia River.*

G. umbrinus. (ID. p. 202.) Umber brown above, grey beneath; throat and feet white. Tail grey, hairy, as long as the head. Length 9 inches. *Louisiana.*

G. talpoides. (ID. p. 204.) Greyish black; chin, throat and tail white; hind feet with but four complete toes. Length nine inches. *Hudson's Bay.*

G. bulbivorus. (ID. pl. 18, B.) Mouth vertical; a wide pouch on each side, not communicating with the cavity of the mouth. Length 14 inches. *Columbia River.*

G. bursarius. (SAY, Long's Exped. Vol. 1, p. 406. SHAW, pl. 138.) Reddish brown or greyish; upper incisors with a deep groove in the middle. Length 9 to 12 inches. *Upper Lakes, Missouri, Florida.*

G. borealis. (BACHMAN, Ac. Sc. Vol. 8, p. 103.) Pale grey; beneath with feet and tail, white; upper incisors scarcely grooved; ears distinct, not concealed. Length 9½ inches. *Columbia River.*

G. townsendi. (ID. ib. Vol. 8, p. 105.) Colored as in the preceding; chin pure white; closely allied to the preceding. Length 10 inches. *Columbia River.*

FAMILY VII. LEPORIDÆ.

Body covered with hair alone. Clavicles rudimentary. Ears long and erect. Eyes large and prominent. Head long, narrow and compressed. Four upper incisors, (in the young six.) Anterior feet with five toes, posterior with four. Tail short, or none. Timid, saving itself by rapid flight.

GENUS LEPUS. *Linneus.*

Incisors above, four; the two in front large, and grooved; the two behind, small. Molars twelve above, ten beneath, cylindrical, compressed, and composed of two vertical soldered folds of enamel. Interior of the mouth, and the soles of the feet, furnished with hair. Tail short and upturned. Hind legs very long. Mammæ six to ten in number. A fold of skin in each groin, forming a sort of pouch.

THE AMERICAN GREY RABBIT

LEPUS NANUS.

PLATE XXVII. FIG. 1. — (STATE COLLECTION.)

Lepus nanus. SCHREBER, Sauge. Vol. 2, p. 881, pl. 234, fig. B.
Rabbit. WILLIAMS, Nat. and Civil Hist. Vermont, p. 91. BELKNAP, Hist. N. Hampshire, Vol 3, p. 113.
L. americanus. DESMAREST, Mam. p. 351. HARLAN, Faun. p. 93. GODMAN, Am. Nat. Hist. Vol. 2, p. 157.
L. americanus. BACHMAN, Ac. Sc. Phil. Vol. 7, p. 326.
L. sylvaticus. ID. ib. Vol. 7, p. 403; and Vol. 8, p. 78.
L. americanus. EMMONS, Mass. Report, 1840, p. 56.

Characteristics. Yellowish grey, varied with brown; throat and abdomen whitish; in winter, the grey color predominates. Ears shorter than the head. Length 15 – 18 inches.

Description. Form typical. Forehead convex. Claws sharp pointed, and nearly straight. Upper anterior incisors white, with a deep longitudinal groove near their inner margins; the small incisors behind short, appressed to the anterior incisors, and inserted into the upper maxillary. First molar above simple, recurved; the four succeeding larger, and of nearly an equal size, composed of double folds of enamel; the last simple, cylindrical, directed forwards, and scarcely attaining the height of its predecessors. Beneath, the incisors are smooth; in front, long and subquadrate. The first molar inclined backwards, grooved before, and with a double groove on the outer surface; the succeeding ones to the last, upright, nearly equal, with a single groove and two prominent ridges on their external surfaces; the last smallest, inclined forwards, with a slight groove on the external surface, and the tip exhibits a double case of enamel.

Color. In summer, the general color is yellowish brown, which becomes more or less rufous on the outer surface of the extremities, and on the breast. Margin of the eyes blackish brown, and outside of this a circle of yellowish white. Throat, and underside of the tail, white; abdomen greyish white. Ears edged with white, and tipped with brown. Fur plumbeous at base, and for much of its length. In winter the fur becomes longer, and the upper surface of the head and body lighter, occasionally iron grey, but I have never seen it as white as is stated by Godman. There may, however, be white varieties, but it cannot be said to have two distinct coats of fur.

Length of head and body,	16·0.	Length of the hind legs,	10·4.
Ditto of the head,	3·8.	Ditto of the tail,	1·5.
Ditto of the ears,	3·2.	Ditto, including fur,	2·8.

Weight, 3 – 4 lbs.

This common and well known species in the United States, has been, until very recently, confounded with others. The following description by Schreber, which seems to have been overlooked by modern writers, applies remarkably well to our Rabbit; although, misled by

the accounts of previous naturalists, he appears to have confounded its history with the following species: Cheeks full of thick hair. Ears thin externally, with few hairs, naked within, and when bent forward, do not reach the nose; when bent backwards, they reach the shoulder blades. Eyes large and black, with 4 – 5 bristles above them. Whiskers mostly black; some are white; the longest appears to reach beyond the head. Color in summer: Ears brownish, with a very narrow black border on the outer margin, of the same breadth to the tips, or becomes effaced; brown cheeks, back and sides; fore and hind legs light brown externally, mixed with black; all round the breech, white. Feet full of short hair of a light brown, unmixed with black, changing towards the inside to a grey white. Upper part of the tail like that of the back, (perhaps mixed with black, as Pennant describes it black;) beneath white. Throat white; lower part of the neck bright brown, mixed with white; chest and belly, inside of fore and hind legs, white. Color in winter, when it does change, white.

According to Foster, Pennant and Schœpff, the most remarkable distinctions of this species are, 1, his size: It is not by any means as large as the common and changeable hare, and scarcely larger than a rabbit; hence he is frequently called *rabbit* in America. 2, the proportion of his legs; the hind feet being longer, and the fore feet shorter than in the others. 3, the color and length of ears: it has a black margin outside, but no black mark at the tip, and the length is less than that of the common hare. 4, the upper side of the tail is not so black as in that species. 5, the color of its body. 6, its mode of living and habits: It can therefore only be a distinct species. Length 18 inches; tail scarcely more than two. Found from Hudson's Bay to Florida. In winter, his short hair changes into a long silky fur, white from the roots. The border of the ear, and upper part of the tail, unchanging. In the southern part of the State of New-York, and the Southern States, he does not change his color, and might therefore be called *the half-changing hare.*

The whole history of the habits of this species, and its abundance, sufficiently confirms the fact that Schreber had our Rabbit in view, although he was misled by Schœpff and Pennant, and confounded two species. We think that in this latter particular, Erxleben has also been in error.

The American Grey Rabbit changes but little with the season, except that the fur is longer and finer, and exhibits a slight tendency to white. Prof. Emmons speaks of having seen them distinctly grey in Massachusetts, and Dr. Bachman has seen them in Carolina of a light iron grey. It is a timid, inoffensive creature; and were it not for its excessive vigilance, and its astonishing powers of reproduction, would soon be extirpated. Indeed we have reason to believe that this actually does happen in certain districts; when their enemies, having nothing to feed upon, also disappear; and after a certain period, the rabbit again resorts to its former haunts, and, undisturbed for some time, increases again in numbers. Beside man, it has many other enemies. In the northern and western part of the State, it is the favorite food of the two lynxes. It is also destroyed by the New-York weasel, the skunk, and by hawks, owls and serpents.

Its food consists of bark, buds, grass, wild berries, etc.; and in cultivated districts, it is said to enter gardens and destroy vegetables. Unlike its congeners, it does not confine itself

to the woods, but is frequently found in open fields, or where there is a slight copse or under-brush. It does not burrow like its closely allied species the European Rabbit, but makes its form, which is a slight depression in the ground, sheltered by some low shrub. It frequently resorts to a stone wall, or a heap of stones, or a hollow tree, and sometimes to the burrow of some other animal. Its habits are nocturnal; and they may often be seen in the morning, or early part of the afternoon, although in retired situations they have been seen at all times of the day. Its flesh, though black and dry, is well flavored, although in this respect it varies with the quality of its previous food. It breeds in this State, as I have been informed, three times in the season, producing from four to six at a birth. It is the smallest of the species found in this State, and so much resembles in its form the European Rabbit, that the same popular name has been applied to it, although differing in color and some of its habits. This, however, is of no consequence, for the name of American or Grey Rabbit is sufficiently distinctive.

It has not a wide geographical range. It is found from New-Hampshire to Florida, but its western limits are not yet established.

THE NORTHERN HARE.

LEPUS AMERICANUS.

PLATE XXVI. FIG. 2, WINTER DRESS. — (STATE COLLECTION.)

Lepus americanus. ERXLEBEN, Syst. Reg. An. p. 330.
L. virginianus. HARLAN, Fauna Americana, p. 196.
L. variabilis, var. GODMAN, Am. Nat. Hist. Vol. 2, p. 161.
American Varying Hare. DOUGHTY, Cab. Nat. Hist. Vol. 1, p. 217, pl. 19, (autumnal dress.) AUDUBON, Orn. Biog. Vol. 2, p. 169, pl. 181, (winter dress.)
L. americanus. RICHARDSON, F. B. A. Vol. 1, p. 217, (excl. syn.)
L. virginianus. BACHMAN, Ac. Sc. Vol. 7, p. 301.
L. americanus. Id. ib. Vol. 8, p. 76.
Prairie Hare. EMMONS, Mass. Report, 1840, p. 58.

Characteristics. Winter dress white, or white tinged with reddish brown. Summer, more reddish brown; beneath white. Ears scarcely shorter than the head. Larger than the preceding. Length 20 – 25 inches.

Description. Head short; nose blunt. Eyes large and prominent. Ears broad and approximated, three and a half inches long. Upper anterior incisors long and slender, moderately grooved; the small posterior incisors not as large as in the preceding species; lower incisors wedge-shaped, nearly straight. Molars more compressed and broader than in the preceding. Skull depressed between the orbits. Body covered with loose, shaggy hair. Hind legs nearly or quite twice the length of the fore legs. Feet thickly covered with hair above and beneath, concealing the long, thin and slightly curved claws. Whiskers long and numerous, black or black and white; a tuft of three or four over the eyes, and some beneath the chin.

Color. Independently of the change by season, it may be said that at no time, unless in

high northern latitudes, can two individuals be found marked precisely alike. At all seasons, the base of the fur is plumbeous above and white beneath. Winter dress: White or nearly so, with irregular spots and dashes of a bright fawn-color, which is more apparent on the fore legs, ears and buttocks; ears margined with blackish brown above, becoming deeper towards the tips; tail and all beneath white. Summer dress: Above bright fawn or reddish brown; forehead, cheeks and ears of the same color; all beneath white; edges of the ears white, bordered with darker, particularly towards the tip. At all seasons, the hair on the soles is soiled white; margin of the eyelids dark brown; pupil dark brown; iris yellowish.

Length of the head and body,	20·0.	Length of the tail,	1·5.
Ditto of the head,	3·6.	Ditto of the fore legs,	6·5.
Ditto of the ears,	3·4.	Ditto of the hind legs,	11·2.

Weight, $6\frac{1}{2}$ lbs.

The dimensions of this species, on the authority of Bachman, vary from seventeen to twenty-five inches. It is remarkable how two observers have so widely differed in their account of the dimensions of the same specimen. Bonaparte gives the total length as thirty-one inches. Harlan's measurement of the same specimen makes it but sixteen inches. These statements may be reconciled, when we recollect that the latter measured from the specimen when it was set up, whilst Bonaparte's dimensions were taken from the specimen when recent, and probably represented the distance from the nose to the extremity of the hind legs.

This Hare was first vaguely indicated by Erxleben in 1777, but his name appears to have excited little attention. The work is exceedingly rare and difficult to procure, and the species continued to be confounded with the *L. variabilis* of Europe for nearly sixty years. Dr. Harlan carefully examined it, and determined it to be a distinct species, and not being aware of Erxleben's name, (which, it may be observed parenthetically, will apply to half a dozen northern hares,) gave it the name of *virginianus*.

It occurs in most parts of the State, and is often called the *White Rabbit*. In the winter, the markets of New-York are abundantly supplied with this species from the Kaaterskill and Shawangunk (Shongo) mountains. As an article of food, it is highly esteemed by many; but, as we suppose, rather from an association of ideas connected with the European hare, than from any merit of its own. It is in itself insipid and tasteless, and not to be compared with the common rabbit. Its food is various, consisting chiefly of grasses, buds, bark, leaves and berries. According to Bachman, they are fond of the young twigs of the spicewood (*Laurus benzoin*), the black poplar (*Populus hudsonica*), and the leaves and berries of various species of Pyrola or Pipsiseway. It lives exclusively in elevated and dry forests of pines and firs, never venturing upon cleared or cultivated lands. Its period of gestation is about six weeks, producing from four to six young at a litter. It makes more resistance when seized than any other species, using its teeth and nails with great freedom. Under certain circumstances, however, all hares will exhibit considerable boldness. We have been informed by an eye-witness, that he saw a European buck rabbit (*L. cuniculus*) attack a cat, and rip open its bowels by a single stroke of its hind claws.

The geographical range of this species is not yet well determined. According to Richardson, it is found in Canada as far north as Hudson's Bay. It is found throughout the Northern States, and as far south as the northern parts of Pennsylvania. Mr. Doughty, in his Cabinet of Natural History, states that he has seen it as far south as Virginia, on one of the highest mountains in the northern part of that State.

We subjoin the description of Erxleben, cited above:

Lepus americanus, L. Cauda abbreviata; pedibus posticis corpore dimidio longioribus; auricularum caudæque apicibus griseis.

Die Hasen. KALM, Hudson's Bay Quadrup. BARRINGTON, Phil. Trans. Vol. 62, p. 11
American Hare. FORSTER, Phil. Trans. Vol. 62, p. 376.

Magnitudine medius inter *L. cuniculum* et *timidum alpinum* (sc. *L. timidus*, Forster, Phil. Trans. Vol. 67, p. 343, et Vol. 62, p. 375). Auricularum et caudæ apices perpetuo grisei. Pedes postici longiores quam in *L. timido* et *cuniculo*. Color griseo-fuscus; hieme in frigidioribus albus.

Habitat in America boreali, ad fretum Hudsonis copiosissimus. Nocturnus. Non fodit. Degit sub arborum radicibus inque cavis arboribus. Parit bis vel semel in anno; pullos quinque ad septem. Caro bona, colore *L. timidi*.

(*EXTRA-LIMITAL.*)

L. glacialis, Leach. (BACHMAN, Ac. Sc. Vol. 7, pl. 21. Summer dress.) In winter white, summer light grey; ears black. Length 27 – 30 inches. *Maine, Newfoundland.*

L. aquaticus. (BACHMAN, Ib. Vol. 7, pl. 22, fig. 2.) Nearly black above, white beneath; ears not as long as the head; feet long and narrow. Length 25 inches. *Alabama, Louisiana.*

L. palustris. (BACHMAN, Ib. Vol. 7, pl. 15, 16. AUDUBON, Birds, pl. 366.) Yellowish brown above, beneath grey; ears much shorter than the head; eyes small. Tail very short, ashy beneath. Length 14 inches. *South Carolina to Texas.*

L. campestris. (RICHARDSON, p. 224.) Lead-colored above, white beneath; in winter pure white, except the ears, which are broadly edged with reddish brown. Length 22 inches. *Northern Regions.*

L. longicaudatus. (GRAY, Loud. Mag. 1837. BACHMAN, Ib. Vol. 8, p. 83.) Blackish brown above, white beneath. Body slender. Tail 4 – 5 inches. Length 24 inches. *Texas.*

L. nigricaudatus, Bennet. (BACHMAN, Ib. Vol. 8, p. 84.) Above fawn tipped with black, beneath white. Tail above black. Length 22 inches. *Texas, Mexico.*

L. californicus. (GRAY, Loud. Mag. 1837.) Dark brown above, beneath white tinged with yellow; ears longer than the head. Length 25 inches. *California.*

L. richardsoni. (BACHMAN, Ib. Vol. 8, p. 88.) Mottled grey above, beneath white, tinged with pale yellowish towards the sides; ears longer than head. Length 19 inches. *California.*

L. townsendi. (BACHMAN, Ib. Vol. 8, p. 90, pl. 2. *L. nuttali*, young, ejusd. auctoris.) Above light grey, beneath white; ears longer than the head, white behind, tipped with black; legs and tarsus very long. Length 26 inches. *Oregon.*

L. artemesia. (Bachman, Ib. Vol. 8, p. 94.) Grey above, beneath white; back of the neck and legs pale rusty; ears as long as the head. Length 13 inches. *Oregon.*

L. bachmani. (Bachman, Ib. Vol. 8, p. 96.) Deep grey above, beneath greyish white; ears longer than head. Length 11 inches.

Genus Lagomys, *Geoffroy.* Ears moderate; hind legs not much longer than those before; clavicles more developed than in *Lepus;* molars ten above and ten beneath. Tail none.

L. princeps. (Richardson, F. B. A. pl. 19.) Blackish brown above, beneath greyish fawn; head short and thick; ears broad and rounded; legs short; toes with naked tubercles. Length 6 – 7 inches. *Rocky Mountains.*

ORDER V. EDENTATA.

Without incisors, and in several of the genera, with no teeth whatever. They have large and strong claws, covering the ends of the toes. Covered with long and coarse hairs, or with scaly plates. Occasionally the mouth drawn out into a flattened beak, and presenting great anomalies in their reproductive organs. Not ruminating. Feed chiefly on vegetables, but also on insects and carcases.

Obs. About twenty-four species, arranged in fourteen genera, are known at present, in North and South America, Africa, India and Australia. Although numerous in the hot and temperate parts of South America, no living representative of this order has been found within the United States. Two fossil genera have been described, but neither have been discovered in this State.

(*EXTRA-LIMITAL.*)

Genus Megatherium, *Curier.* Anterior toes four, posterior three. Size gigantic. Claws large, and with a bony sheath. Molars eight above and eight beneath; crowns of the molars with two transverse angular ridges. Body covered with a bony coat of armor. Tail large and very robust. Clavicles perfect. Herbivorous.

M. cuvieri. (Mitchill, Ann. Lyc. Vol. 1, p. 58. Cooper, Ann. Lyc. N. Y. Vol. 1, p. 114, pl. 7; Vol. 2, p. 267.) Toes with strong claws, two of which are rudimentary. Height seven feet; bulk of the rhinoceros. (Marshes of Skidaway Island, Georgia; and said to exist also at White Bluff, sea coast of Georgia. Originally found near Buenos Ayres. Another from the Rio del Sauce, near Montevideo.)

Genus Megalonyx. Claws large, nearly seven inches long, and furnished with a bony sheath. Molars eight beneath, composed each of a simple cylinder of enamel; crowns simple cavities, surrounded by the enamel. Clavicles perfect.

M. jeffersonii. (CUVIER, Oss. Foss. Ed. tertia, p. 160. COOPER, Ann. Lyc. Vol. 3, p. 166; Am. Month Mag. Vol. 1, p. 157. — *M. laqueatus.* HARLAN, Ac. Nat. Sc. Vol. 6, p. 269; Med. and Phys. Res. p. 271, 319 et. seq.) About the size of an ox. The teeth, as far as they have been examined, seem to present some striking differences; and Dr. Harlan seems disposed to consider some of them as indicating the type of a new genus, which he terms *Pleurodon.*

The remains of this animal have been found in Bigbone Cave, Tennessee; at Bigbone Lick, Boone county, Kentucky; in a cave in Greenbriar county, Virginia; and at White Cave, Edmondson county, Kentucky. They have also been discovered in the banks of the Rio Brazos, a few miles above St. Felipe, Texas, associated with the bones of the Mastodon; and according to Martius and Spix, in a cave in Brazil. The fullest and best account of its osteology will be found in the work of Harlan, cited above.

ORDER VI. UNGULATA.

Comprises numerous herbivorous animals, exhibiting great variety in size and structure, but all united by one common character, viz: The toes covered by a horny case or hoof, which either embraces the toes separately, or the foot is enclosed in a single hoof. In some the muzzle is elongated into a cylindrical tube; in others, the head is furnished with simple or branched horns, which are sometimes only sexual distinctions.

FIRST TRIBE. PACHYDERMATA.

Generally three sorts of teeth. Stomach simple or compound, but not adapted for rumination. No horns on the head. Many of the species extinct.

FAMILY I. ELEPHANTIDÆ.

Toes concealed under the skin, their tips only distinct. Snout elongated into a long and flexible proboscis. The largest of terrestrial animals, and in the living state, found only in the Eastern Continent. It comprises the Elephant, Mastodon, Rhinoceros and Hippopotamus, embracing at present eight living and twenty-one fossil species.

GENUS ELEPHAS. *Linneus.*

Upper incisors in the form of enormous tusks, slightly arched towards the tips, a vertical section presenting curvilinear lozenges. Molars four above and four beneath, composed of vertical laminæ. With a long flexible proboscis. Five toes on all the feet. The skin of the living species thick, with scattering hairs.

THE FOSSIL ELEPHANT.

ELEPHAS PRIMIGENIUS.

(CABINET OF THE LYCEUM.)

MITCHILL, Cuv. Theory, N. Y. Ed. figure.
HARLAN, Ac. Sc. Phil. Vol. 3, p. 65, pl. 5.

Numerous remains of the Fossil Elephant, belonging apparently to the species *primigenius*, have been found in various parts of North America, from the frozen mud near Behring's Straits, to the marshes of Carolina and Texas.

The multitude no less than the magnitude of these bones in certain localities, is well calculated to excite astonishment. Hedenström, in his survey of the Laechow islands on the north-eastern coast of Siberia, remarks that the first of these islands is little more than one mass of these bones; and that although the Siberian traders have been in the habit of bringing over large cargoes of them for upwards of sixty years, yet there appears to be no sensible diminution. The teeth (tusks?) found in these islands are much whiter and more fresh than those of the continent. The most valuable were met with on a low sand bank on the western coast; and there, when, after a long prevalence of easterly winds, the sea recedes, a fresh supply is always found. From this, Hedenström infers that large quantities must exist at the bottom of the ocean.

One of the most singular discoveries in modern times, was that of an extinct elephant imbedded in a mass of ice on the northern coast of Siberia. Its body was nearly entire, and covered with thick fur, consisting of coarse hair from ten to fifteen inches long, and beneath this a slightly curled wool. Specimens of this hair may be seen in the Cabinet of the Lyceum of Natural History, New-York.

Fischer has analysed and distinguished six fossil species of Elephants; and Dr. Harlan appears to think it probable that two distinct species once existed in the United States, but the peculiar characteristics of each do not seem to be distinctly defined. According to Cuvier, the fossil elephants belonged to a geological period more ancient than the Mastodon, but we often find them associated together in the same formation. It is true that little more than the molars only have been discovered, thereby seeming to indicate that all the other bones had perished at a period long anterior to the destruction of the Mastodon. We should, however, recollect that the osteology of the two genera are very intimately allied; and that from the fact that greater numbers of teeth of the Mastodon have been found, all the large bones are, without due examination, hastily referred to that genus. Besides the molars of the Elephant, few of the other portions of the skeleton have been identified. At Bigbone Lick, where their remains as individuals appear to be in proportion to the Mastodon as one to five, little more than the bones of the head, and in one instance two nearly complete heads, have been identified. Moreover, it does not appear ever to have been as numerous a species as the Mastodon.

The principal localities of the Fossil Elephant in the United States, are the Bigbone Lick, Kentucky; Biggin Swamp and Stone, South Carolina; Ohio, Pennsylvania, North Carolina, Maryland, and Schooley's mountain in Monmouth county in New-Jersey. In this State we are acquainted with but one locality. There is, however, in the Museum of the Albany Institute, a portion of the tooth of an elephant said to have been found on the line of the Erie canal, but the precise locality is not known.

AMERICAN ELEPHANT.

ELEPHAS AMERICANUS.

PLATE XXXII. FIG. 2.—(CABINET OF THE LYCEUM.)

It is with some hesitation that I venture to designate, under a new name, a species founded on specimens of teeth, which appear to differ widely from any hitherto met in this country. The tooth found on the banks of the Susquehannah, near Tioga, March, 1786, and figured in the Columbian Magazine, approaches it somewhat, but can scarcely be referred to the same species. The specimens above alluded to were found in a diluvial formation near the Irondiquoit river in Monroe county, ten miles east of the city of Rochester. According to a writer in the American Journal, Vol. 32, p. 377, these remains consisted of a tusk and two molars, one of which is in the Cabinet of the Lyceum, and is that figured in the plate. This is six inches in its greatest depth; and, as nearly as can be conjectured from the part which remains, it must have been about eight inches long, and three in breadth on its grinding surface, which is, however, too much injured to exhibit the ends of the enamel. There are thirteen plates in a space of five inches, and they are more compressed than in any fossil species with which I am acquainted, being almost in contact, with very little interstitial substance. It is altogether different from any fossil elephant hitherto described, and merits the distinct appellation of *E. americanus*.

NOTE. Texas appears to be a rich locality for elephantine bones. From the Houston Telegraph, April, 1840, we learn that a large collection of molars, tusks and other bones of the Elephant, were found in the banks of a ravine about two miles below Bastrop, covered with a bed of loam ten or twelve feet thick. A similar collection was obtained from the bed of the Rio Brazos. They were associated with the teeth and tusks of the Mastodon, described in the subsequent article. Some of the teeth are now in the Cabinet of the Lyceum of Natural History, New-York.

GENUS MASTODON. *Cuvier.*

Many characters in common with the Elephant, which it equalled or surpassed in size. Molars with sharp, elevated, conical teeth, which, when partly worn, display lozenges of enamel. In the adult, four molars above and four below. A vertical section of the upper incisors or tusks exhibits concentric plates of enamel. In the young, there are two incisors in the lower jaw, straight, short and conical. Tail moderate, about the length of that of the Elephant.

Obs. The whole amount of teeth in the Mastodon, from infancy to old age, appears to be twenty-six. In infancy, sixteen molars and two lower incisors; the hindmost molars, as they emerge, gradually pushing the others forward and out of their places, until the latter all drop out, and a large solitary tooth is left in each jaw. It is obviously inferred that they possessed long flexible trunks, as in the Elephants; and its habits are similar, though less exclusively herbivorous.

THE GREAT MASTODON.

Mastodon maximus.

(CABINET OF THE LYCEUM.)

Animal incognitum. Rembrant Peale, Hist. Disq. Loud. Mag.
Mastodon giganteum et *maximus.* Cuvier, Oss. Foss.
Rhinoceros, Tetracaulodon and *Mammoth*, of various writers.*

From an early period in the history of this country after its settlement by Europeans, large bones were occasionally found, which excited considerable speculation. They were considered, according to the intelligence of their respective discoverers and commentators, as having belonged to a race of giants or fallen angels, or to have belonged to Elephants. It was reserved for Cuvier, in the work cited above, to show that they belonged to an animal generically

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* The American authorities are so numerous, that it would require too much space to insert them all. For those who are disposed to investigate the American history of the discovery of this animal, we would make the following references:

Mather, Royal Philos. Trans. 1712.
Dudley, Mass. Hist. Coll. 2nd series, Vol. 2, p. 263.
Turner, Am. Phil. Trans. Vol. 4, p. 510.
Hunter, Am. Museum, Vol. 5, p. 152.
Collinson, Ib. p. 155; Ib. Vol. 8, p. 284.
Madison, Phil. Med. & Phys. Vol. 2, p. 58, Ib. Vol 1, p. 156.
Bossu, Ib. Vol. 1, p. 179.
Jefferson, Ib. Vol. 1, p. 64.
Barton, *Rhinoceros!* Ib. Vol. 2, p. 1, p. 158.
Drayton, Hist. Carolina.
Graham & Miller, Med. Rep. Vol. 4, p. 211 and 308.
Mitchill, Med. Rep. Vol. 9, p. 322; Vol. 11, p. 318, 319.
Madison, Ib. Vol. 15, p. 38.
Cuvier, Theory of the Earth, N. Y. Ed
Peale, Am. Phil. Trans.
Godman, Vol. 3, p. 478; Vol. 4, p. 317.
Id. Ac. Nat. Sc. Vol. 4, p. 67.
Harlan, Fauna Americana.
Id. Med. and Phys. Researches.
De Kay, &c. Ann. Lyc. Vol. 1, p. 143.
Cooper, Am. Jour. Geol. Vol. 1, p. 158.
Id. Am. Jour. Sc. Vol. 12, p. 381; Vol. 14, p. 187; Vol. 27, p 166; Vol. 31, p. 171.

distinct from the Elephant, but allied to it in bulk, habits and other particulars. Since that time, numerous species have been described in various parts of the world.

In this country, there is scarcely a State east and south of the Hudson river, which has not afforded specimens of the Mastodon. Along the Atlantic coast, few remains have been found east of that river. The chief localities we have noted were at Cheshire, Connecticut, thirteen miles north of New-Haven, in diluvial gravel (Am. Jour. Vol. 14, p. 187); and at Berlin and Sharon in the same State (Id. Vol. 27, p. 166). We are not aware that any have been found in the more northerly States, although, on the western coast of America, they have been found in the latitude of 66° north.

In this State, the remains of this animal were discovered near Claverack, as early as 1705, and formed the subject of a note from the celebrated Dr. MATHER, which appeared in the English Philosophical Transactions, 1705, July 23: "There is a prodigious tooth brought "here, supposed to be the tooth of a man, from the shape. It weighs $4\frac{3}{4}$ lbs. It was dug "up on the side of a hill, thirty or forty feet under ground, near a place called *Claverack*, "about thirty miles this side of Albany. It is looked upon here as a mighty wonder whether the "tooth be of man or beast. Other bones were dug up, which crumbled away upon exposure "to air. They say one of them, which is thought to be a thigh bone, was seventeen feet long." (DUNLAP, *Hist. N. York*, Vol. 2, appendix, p. 154.)

In 1782, they were found in a swamp near Montgomery, Orange county, and in greater numbers at Shawangunk, Ulster county. Shortly after, portions of eight distinct individuals were discovered within eight or ten miles of Montgomery. In 1801, Mr. Peale succeeded in disinterring, from this region, an almost entire skeleton.

Since that period, other localities have been discovered, the most remarkable of these are,

1. From Rockland county, in 1817; and from Chester, Orange county, of which numerous specimens are in the Cabinet of the Lyceum. A full account of the exploration connected with these bones may be found in the American Edition of Cuvier's Theory of the Earth, before referred to.

2. In the same year, remains were found in the city of Rochester, four feet below the surface, in a hollow or water course.

3. In 1823, more than one-half of a lower jaw, with the teeth, on the shore of Long-Island, between high and low water mark, about four miles east of the county court-house at Riverhead, Suffolk county. It is now in the Cabinet of the Lyceum of Natural History, New-York. It may be noted that a very large molar, in Dr. Morton's collection, was fished up from a similar locality, namely, in the ocean at Longbranch, New-Jersey. The bed of the German ocean appears to be a rich locality for the bones not only of the mastodon, but also of the elephant. In Loudon's Magazine for 1839, there is a figure and description of the molar of a mastodon dredged from the Dogger Bank; and Woodward, in his Geology of Norfolk, states that upwards of two thousand molars of the elephant (and probably of the mastodon), had been dredged up by the fishermen of one little village (Hasbro'), in the space of thirteen years.

4. At Geneseo, Livingston county, (see Am. Jour. Vol. 12, p. 381,) the greater part of a skeleton was found in a marsh two feet and a half below the surface, in vegetable mould, and resting upon a bed of fine white gravel.

5. In 1831, the molar tooth of this species was found near Jamestown, Chautauque county. This is stated in the 27th volume of the American Journal of Science to have been two and a half inches long and one inch broad, and to have been found ten feet below the surface.

6. A fine portion of the lower jaw of a young mastodon, from the town of Montgomery, Orange county. This specimen enlarged our knowledge of the dentition of the mastodon, exhibiting two short straight tusks from four to six inches long. It would appear that these lower incisors are in some instances permanent for a considerable period; but whether this is a sexual characteristic, or an accidental case of anomaly, is not yet determined. Upon this specimen, however, the reader will find an attempt made to construct a new genus under the name of *Tetracaulodon*.

7. In the town of Shawangunk, Ulster county.

8. At Perrinton, near Rochester, Monroe county.

9. At Coeymans, Albany county.

10. At Hinsdale, Cattaraugus county, a tusk was found seventeen feet beneath the surface. The soil was composed of alternate strata of sand and gravel.

11. In 1841, in a bed of marl three miles south of Le Roy, weighing two pounds.

12. A tooth was found in digging a mill-race on Goat Island, Niagara county, twelve or thirteen feet below the surface.

The Great Mastodon, or *Mammoth*,* as it is sometimes improperly called, equalled or exceeded the Elephant in bulk, and greatly resembled him in shape. The greatest difference in this latter particular was in the elevation of the fore shoulders, while in the elephant the back was regularly arched. Cuvier, from an examination of the situation and direction of the pelvis, inferred that the belly must have been smaller, and consequently the intestines less voluminous than in the elephant; and this, in connection with the structure of the teeth, leads us to the conclusion that the mastodon did not exclusively feed on leaves, limbs and tops of young trees. The position of the molars, which diverge in front from each other, also varies from those of the elephant, and much more nearly resembles those of the hog and hippopotamus. To these animals it would seem that he is still farther allied, in his fondness for swamps and marshy places, where his bones are for the most part found under circumstances which lead to the irresistible conclusion that he lived and perished in those places. It was at first supposed that it was exclusively a northern animal, and like the fossil elephant of Siberia,

* The impropriety consists merely in using a term which had been specially applied by the inhabitants of Siberia to a fossil elephant; but as the two fossil animals are both gigantic, and nearly allied, we saw no reason for announcing in characters as large as a modern play-bill, the following label over the bones of the Mastodon in the Collection of the Garden of Plants at Paris: "Le Grand Mastodon, improprement nommé *Mammouth* par les Anglo-Americains"! We believe this offensive label has been recently removed.

furnished with hair adapted for its residence in a cold region. Other species, however, were soon discovered in South America, and subsequently in the Burman Empire. The genus Mastodon then embraces species found in almost every part of the world, and in all latitudes. In the United States, but a single species has been found; and its remains, thus far, have been found along the Atlantic coast, from New-York to the Gulf of Mexico. In South America, he appears to have been replaced by another species (*angustidens*).

The geological period at which this huge animal existed, has occasioned much attention. It must have been among the most recently extinct of all quadrupeds, unless we except some species whose generic types still exist on this continent. Rejecting as altogether fabulous the pretended discovery of the stomach of this animal, with its contents, consisting of reeds, twigs and grass, as detailed by Barton (Med. and Phys. Jour. Vol. 3, p. 23), it has certainly been discovered in positions indicating that the animal perished and left its bones on or near the surface where they are now found. Cuvier states that the mastodons discovered near the Great Osage river, were almost all found in a vertical position, as if the animals had merely sunk in the mud (Oss. Foss., Ed. alt. Vol. 1, p. 217, 222). Since that time, many others have been found in swamps, a short distance beneath the surface, (frequently some of the bones appearing above the soil,) in an erect position; conveying the perfect impression that the animal (probably in search of its food) had wandered into a swamp, and unable to extricate himself, had died on the spot. Such an incident doubtless occurred to the animal whose bones we assisted to disinter, some years ago, at Longbranch, New-Jersey. He was in a natural vertical position, his body supported by the turf soil or black earth, and his feet resting upon a gravelly bottom. The occurrence of the bones of other animals not yet extinct, in company with those of the mastodon, is not a conclusive evidence of their cotemporaneous existence; but we cannot deny that it furnishes strong reasons for believing them to have been of a very recent date. We think it highly probable that the mastodon was alive in this country at a period when its surface was not materially different from its actual state, and that he may have existed cotemporaneously with man.

There is one fact connected with the discovery of the bones of the mastodon in this country, which appears to have been passed over as doubtful or apocryphal. We allude to the possibility, that upon a due investigation, some of the softer parts may be detected. Mr. Graham, an intelligent observer, when describing (Med. Repos. Vol. 4, p. 414) the mastodon bones in Montgomery, states, that "hair was found three inches long, and of a dun color." Judge Miller, in describing the appearance of the skeleton at Shawangunk, Ulster county, says, that "around and in the immediate vicinity were locks and tufts of hair of a dun brown, an inch "and a half to two and a half inches long, and in some instances four to seven inches in "length." This description corresponds with the specimen from the fossil elephant of Siberia, in the Cabinet of the Lyceum. In the account of another specimen, Mitchill (Appendix to Cuvier's Theory) says, "Beneath the bones, and immediately around them, was a stratum of "coarse vegetable stems and fibres resembling chopped straw, or rather drift stuff of the sea; "for it seemed to be mixed with broken fibres of conferva, like those of the Atlantic shore." Whether the original observers were deceived by mistaking this appearance for hair, or

whether Mitchill himself was misled, it is probable that both alluded to the same substance. It is now impossible to determine this point, but it is to be regretted that a more critical examination was not made at the time, and the substances themselves submitted to chemical analysis.

FAMILY II. SUIDÆ.

With teeth of various kinds. Toes more than two, cleft into distinct hoofs. Muzzle for the most part elongated.

Obs. The animals of this group are distributed over the globe, and comprise at present about twenty species. More than double that number of extinct species have been discovered. In this State we have but one representative of this family, and that one has been introduced from Europe.

GENUS SUS. *Linneus.*

Four toes on all the feet; the two posterior short, not touching the ground. Incisors, $\frac{6}{6}$; *canines,* $\frac{2}{2}$; *cheek teeth,* $\frac{14}{14} = 44$. *Lower incisors nearly horizontal. Canines often very large, triangular, directed outwards. Body covered with strong bristly hair.*

THE COMMON HOG.—(*Introduced.*)

Sus scrofa, Var. domestica.

This well known and useful animal is derived from the Wild Boar, still found in the temperate regions of Europe and Asia. It accompanied the first settlers in this State, and soon became numerous. "Some of our people," observes Vanderdonck, "prefer the English "breed, as they are more hardy, and subsist better in winter without shelter; but the Holland "breed grows much larger and heavier, and have thicker pork." From the same writer we learn that it was a common practice at that time in the neighborhood of New-York, to drive the hogs into the woods in the spring, and to recall them in the autumn; a practice which is still kept up in the thinly settled portions of the State at the present day. The sow goes with young about four months, and produces eight to twelve, and even more, at a litter.

Traces of the large limbed Dutch breed of hogs may still be found in some districts, which have been known to weigh more than a thousand pounds. Our common breed of hogs has been much improved of late years, by crossing with the English, Berkshire and Chinese varieties. The former is more particularly in request, on account of the flavor of its meat, and as producing large litters. We think it susceptible of still farther improvement, by judicious crossing with the old Dutch breed alluded to above.

(*EXTRA-LIMITAL.*)

Genus DICOTYLES, *F. Cuvier.* Posterior feet with three toes only, the external wanting. Incisors, $\frac{4}{6}$; canines, $\frac{2}{2}$; cheek teeth, $\frac{12}{12} = 38$. A fetid gland on the lumbar region. Tail obsolete.

D. torquatus. (NUTTAL, Trav. in Ark. p. 155. CUVIER, Mam. plate.) A whitish band descending obliquely from each shoulder to the sides of the neck. *Red river, Arkansas.*

Genus TAPIRUS, *Brisson.* The existence of this genus within the limits of the United States, rests upon a single fossil tooth from Bigbone Lick, and described by Dr. Harlan (Fauna, p. 224) under the name of *Tapirus mastodontoides.* It has been questioned whether this may not have belonged to a young mastodon, but the comparison instituted by Dr. Harlan (Med. and Phys. Res. p. 265) at Paris, establishes clearly its position in this genus.

FAMILY III. EQUIDÆ.

A single solid hoof, with but one apparent toe; although they have, beneath the skin, two protuberances on each side, representing lateral toes. Although exclusively herbivorous, they have nearly simple stomachs, and do not ruminate.

Of this family we have no native species. Two have been introduced.

GENUS EQUUS. *Linneus.*

Cutting teeth, $\frac{6}{6}$; *canines,* $\frac{2}{2}$, *seldom present in the female; molars,* $\frac{12}{12} = 40$. *Tail uniformly covered with long hair. Ears moderate.*

THE HORSE.—(*Introduced.*)

EQUUS CABALLUS.

This noble and useful animal is too well known to require description. Originally from Asia, where the species still exists in a wild state, it has been domesticated from time immemorial, and has been distributed by man over the globe. On this continent, troops of wild horses, from the domestic stock, are found in immense numbers. They are not uncommon on the extensive plains west of the Mississippi. They were once numerous on the eastern side of the Rocky mountains, near the northern sources of the Columbia river; but at present, they are said not to be found wild, north of the fifty-third parallel.

In this State, the Horse was introduced at an early period. Vanderdonck, speaking of the Horses of the Colony of Nieuw-Amsterdam, says, "The horses are of the proper breed for "husbandry, having been brought from Utrecht for that purpose, and this stock has not dimi- "nished in size or quality. There are also horses of the English breed, which are lighter, "not so fit for agricultural purposes, but are well adapted for the saddle. These are not so

"expensive as the Dutch breed, and are easily obtained, (from New-England?) *Curaso* or "Arabian horses are likewise imported into the country, but are not very acceptable, as they "can scarcely endure the climate, and often die in winter. Fine large horses are bred in the "country, which live long, and are seldom diseased." The Curaso horses, mentioned above, according to the Albany Dutch Records, were imported from the Island of Curaçoa, between which place and New-Amsterdam there was a brisk traffic carried on as early as 1637.

It appears from the statement given above, that the horses of this State were originally of the Dutch race, subsequently of the English stock, and were at that early period with an admixture of Arabian blood. Much attention has since been paid to the improvement of the breed, by the importation of the best Arabian horses; and we believe it is now generally conceded, that in the combined qualities of speed and endurance, the horses of this State are excelled by none in the world.

THE ASS.—(*Introduced.*)

EQUUS ASINUS.

This useful animal is a native of the East; it is considered to be generically different from the Horse by some writers, on account of its long ears, tufted tail, and the absence of callosities on its hind legs. It breeds occasionally with the horse, and the product is called a *mule* or *hinny*, according as the ass is the male or female parent. It is a hardy animal, requiring little care, but has not been much attended to in this State. In Kentucky, and some others of the western States, much attention has been paid to the ass, and its cross with the horse; and a fine breed has been raised, which readily commands high prices.

(*EXTRA-LIMITAL.*)

THE FOSSIL HORSE.

EQUUS MAJOR.

Teeth and bones of the Horse have been found in various parts of the Union, but I am unacquainted with any locality in this State. The nearest approach to it are the teeth and vertebræ found near the Navesink hills in New-Jersey, described by Mitchill in the Appendix to the New-York edition of Cuvier's Theory of the Earth, and also noted at pages 7 and 8 of his Catalogue of Organic Remains. They have also been found on the north branch of the Susquehannah; in digging the Chesapeake canal, near Georgetown, D. C.; and in North Carolina, sixteen miles below Newbern. They resemble those of the common domestic horse; but from their size, apparently belonged to a larger animal.

Second Tribe. Pecora.

No incisors in the upper jaw; canines for the most part wanting; molars of a uniform character, usually twelve above and twelve beneath. The two middle toes separate, as if cloven. Frontal bone, in the greater number of families, furnished with horns, at least in the male sex. With four stomachs. Chewing the cud, or ruminating. Herbivorous. Intestinal canal long. Teats between the thighs. Useful to man as beasts of burthen, or as food.

FAMILY IV. BOVIDÆ.

Horns in both sexes, persistent, usually round, smooth, pointed, never straight; increasing by ringlets at the base. The porous nucleus supporting the horn, is a prolongation of the frontal bone. No canine teeth.

Obs. This family comprises animals hitherto arranged under the genera Bos, Antilope, Capra and Ovis; and including, as now restricted, about eighteen species, included by the most recent writers under seven genera. But four species of this family are found in North America, and, with the exception of one introduced species, none now exist within the limits of the State of New-York.

GENUS BOS. *Linneus.*

Horns smooth, directed laterally at first, afterwards recurved, arising from the crest. Body thick and heavy. Limbs strong. Tail moderately long, with a terminal tuft of hair. Muzzle broad, black, naked. Hair smooth, straight.

THE COMMON OX.—(*Introduced.*)

Bos taurus.

The primitive stock of this animal, whose domestication has exercised such an extensive influence over the condition of man, is unknown. It was introduced into this State by the earliest colonists, and was originally of the large Holstein or Dutch breed; and it is but a few years since, on the Hudson and Mohawk, there existed undoubted remnants of stock imported by the Dutch settlers from Holland (Cultivator, Vol. 2, p. 28). We learn from Vanderdonck, that "the cattle in the New-Netherlands are mostly of the Holland breed. Many "were brought over from Amersfort in the province of Utrecht. They have also English "cattle in the country, purchased from the English in New-England." The principal and best varieties at the present day are of English descent, and great attention is paid to improve their most desirable qualities. It has been observed that the imported stock does not always

sustain its foreign reputation, in consequence of a change in its food, treatment, or perhaps from a difference in climate; but when mixed with our native stock, the half-bloods exhibit a decided improvement.

(*EXTRA-LIMITAL.*)

B. moschatus. (GODMAN, Am. Nat. Hist. Vol. 3, plate.) Horns contiguous, broad at the base, directed laterally and downwards against the cheeks, and ending in round points directed upwards. Now arranged under *Ovibos. Arctic Regions.*

(FOSSIL.)

B. bombifrons. (Phil. Soc. Vol. 1, p. 379. HARLAN, p. 271. COOPER, Am. Month. Vol. 1, p. 172.) Summit of the head convex, arched; horns distant, rather flattened at base, projecting laterally and downwards. *Kentucky.*

B. latifrons. (HARLAN, p. 273. GODMAN, figure. COOPER, Am. Month, Vol. 1, p. 173.) Summit of the head broader than high; horns long, round, and directed laterally and upwards. *Kentucky.*

B. pallasii. (DE KAY, Ann. Lyc. Vol. 2, p. 280.) Summit of the head depressed; horns short, flattened and turned downwards. *Kentucky, Missouri.*

Genus BISON, *Smith.* (Extirpated.) Forehead slightly arched, much broader than high; shoulders elevated; tail short; legs slender; hair soft and woolly; a beard.

B. americanus. (GODMAN, Vol. 3, figure.) Horns small, round, directed laterally and upwards. Chesnut brown or blackish.

OBS. The Bison, or American Buffalo, has been long since extirpated from this State; and although it is not at present found east of the Mississippi, yet there is abundant testimony from various writers to show that this animal was formerly numerous along the Atlantic coast from New-York to Mexico. Warden asserts, that at no very distant period, it existed in Pennsylvania;* and as late as 1756, large herds were found in Kentucky. They are now only found on the plains of Missouri; and from the murderous warfare directed against them, the day is not far distant when the whole race will be extirpated.

FAMILY V. CAPRIDÆ.

Horns persistent, (in many genera exclusively in the males,) on a bony nucleus nearly solid: The horns for the most part simple, often compressed more or less, angular, with elevated knobs or rings at the base. No canine teeth.

OBS. This family contains, in the writings of the most recent systematists, between seventy and eighty species, arranged among twenty genera. It is composed of the old genera Ovis, Capra and Antilope, but comprises many new forms. We have but few representatives of

* One of our most learned and acute philologists states, that about the years 1785 or 1790, the bison was not uncommon on the Monongahela, Pennsylvania, adjoining Mason & Dixon's line. He has evidently been misinformed, not only in the fact that the bison is merely a variety of the European ox, but also in the assertion that the product of the bison and domestic cow will again propagate. (*Archæologia Americana*, Vol. 2, p. 139.)

this family in the United States, and, with the exception of two introduced species, none within the limits of this State. The *common goat* (Capra hircus) has been introduced, but not to any extent, and is considered of little value.

GENUS OVIS. *Linneus.*

Lower incisors eight. No muzzle. Horns (generally common to both sexes) with a cellular bony nucleus, large, triangular, directed backwards, and returning spirally more or less in front. No beard. Forehead arched. Tail short. Mammæ two, inguinal.

THE DOMESTIC SHEEP.

OVIS ARIES.

The primitive stock of this well known and useful animal is supposed by some to be the *O. ammon;* while others consider it to be a distinct species whose primitive type is the *O. musmon*, still found wild in the mountainous districts of eastern Europe.

The original stock of sheep in this State was derived from Holland, as we learn from Vanderdonck, who wrote about the year 1650. It is probable that they were almost immediately crossed with the common English breed, imported into the neighboring colony of New-England. "Sheep," he says, "are also kept in the New-Netherlands, but not as many as "in New-England, where the weaving business is carried on, and where much more attention "is paid to them than by the New-Netherlanders. The sheep, however, thrive well, and "become fat enough. I have seen mutton there so exceeding fat, that it was too luscious "and offensive. The sheep breed well, and are healthy; they find good pasture in summer "and good hay in winter; but the flocks require to be guarded and tended on account of the "wolves, for which purpose men cannot be spared. There is also a more important hindrance to the keeping of sheep, which are chiefly cultivated for their wool. New-Netherland "is a woody country throughout, being almost every where beset with trees, stumps and "brush-wood, wherein the sheep pasture, and by which they lose most of their wool. This "is not apparent until they are sheared, when the fleeces turn out very light."

It is interesting to compare the account of the early introduction of sheep into New-York, with the results after a lapse of nearly two hundred years. By the census of 1840, there were no less than 5,381,225 sheep in the State of New-York alone.

The common sheep of this State formerly yielded a coarse wool, scarcely averaging three pounds to the fleece; they were excellent breeders, and the young throve well even when entirely neglected. Within the last forty years, the introduction of foreign varieties, remarkable for the fineness of their wool and the improved quality of their flesh, has caused the old common stock in this State to disappear.

The first variety introduced into New-York, was the Spanish merino: this occurred in 1801. It was not, however, until seven or eight years after, that their importance began to be appre-

ciated. A *mania* for sheep then commenced, scarcely inferior to the *tulip mania* of Holland, or the *morus multicaulis speculations* of our own country at a recent period. As much as a thousand dollars, and in some instances nearly twice that amount, was paid for a single ram. Of the Spanish merino races, there are three distinct varieties, known under the names of the Paular, Negretti and Guadaloupe breeds.

The quality of the fleece was still farther improved in 1824, by the introduction of what are termed *Saxony sheep*. These are originally of the Spanish merino race, introduced into Saxony about one hundred years ago, and upon which great pains and care had been bestowed. To improve the quality of the flesh, our sheep have been still farther crossed with the Bakewell or New-Leicester breed, and also with the South-downs, both from England. The former was first introduced into this State in 1815, by Mr. Dunn of Albany, and the latter only a few years since.

The period of gestation in the Sheep is about five months, producing one or two at a birth, rarely more. The two middle incisors drop out at the end of the first year, and are replaced by others; at two years, the two next; at three, four are renewed; and at the end of the third year, or three and a half, all have been replaced, and the individual is then said to be full mouthed.

(*EXTRA-LIMITAL*)

O. montana. ***Argali, Big-horn, Rocky Mountain Sheep.*** (Richardson, pl. 23. Godman, plate.) Horns in the male very large, contiguous, curved in a gentle spire; in the female, smaller, erect, slightly curved backwards and outwards. ***Rocky Mountains.***

Genus Capra, *Linnæus.* Teeth as in the genus Ovis; forehead concave; horns generally common to both sexes, either vertical or inclined more or less, angular; two sorts of hair; chin bearded.

C. hircus. Common Goat. Introduced.

C. americana, Blainville. (Ord. Ac. Sc. Smith, Lin. Trans. plate. Godman, Vol. 2, plate.) ***Rocky Mountain Goat.*** Horns black, nearly erect, conical, slightly curved backwards, obscurely ringed at the base, smooth and polished at the tips; muzzle extremely small. Color white, with long straight hair. Larger than the common goat. Ranges from forty to sixty-five parallels.

Genus Antilope, *Smith.* Horns compressed, placed beneath the frontal crest, round or compressed; chin beardless. Body slender, standing high on the legs, with a general resemblance to that of a deer.

A. americana. ***Prong-horned Antilope.*** (Godman, Vol. 2, plate. Richardson, pl. 21.) Horns compressed, black, tapering, curved inwards towards each other; a small snag or antler at about one-third of its height, projecting forwards. ***Plains of Missouri.***

(FOSSIL.)

O. mammilaris. (Kirtland, Am. Jour. Vol. 31, p. 82, plate.)

FAMILY VI. CERVIDÆ.

Horns solid, deciduous, (in most of the genera, in the male only.) No incisors above, eight beneath. Occasionally canines above. A sub-orbital sinus, or glandular cavity at the inner angle of the eye; pupils elongated. Tail short. Legs slender. Feet bisulcated.

Obs. This family, which is founded on the old linnean genus Cervus or Deer, now comprises forty-five real or nominal species, distributed, according to the ideas of systematic writers, into eight or ten genera. But six species are found within the United States, and of these, three only exist in the State of New-York.

GENUS CERVUS.

Horns always present in the males, branched, sub-palmated or simple; the horn arising rounded from a burr or rose-shaped base. Ears large. Mammæ four, inguinal. No canine teeth. A muzzle. Tail short, bushy.

THE AMERICAN DEER.

CERVUS VIRGINIANUS.

PLATE XXVIII. FIG. 1.

Dama virginiana: RAY, Syn. Quad. p. 86. F. CUVIER, Mamm. lithog. plate.
Cervus virginianus. HARLAN, Fauna Amer. p. 239. GODMAN, Am. Nat. Hist. Vol. 2, p. 306, plate.
Mazama id. HAMILTON SMITH, Griffith's Cuv. Vol. 4, p. 127, and Vol. 5, p. 315.
C. (*Mazama*) *mexicanus* et *clavatus*. HAMILTON SMITH, Ib. p. 315.
Fallow Deer. EMMONS, Mass. Report, 1840, p. 81.

Characteristics. Reddish or bluish grey, according to the season. Young, spotted with white. Horns moderate, curving forward, with the concave part in front, with from one to six points, occasionally palmated.

Description. Head long and slender. Muzzle pointed. Eyes large and lustrous, the lachrymal pits consisting of a slight fold of the skin. Tail moderate, depressed. Legs slender. A glandular pouch concealed by a thick tuft of rigid hairs inside of the hind legs, odoriferous, and connected with the sexual appetite. The horns of the adult male vary so much in shape, that scarcely any two are alike; appearing to depend upon age, season, and abundance or scarcity of food. In the first season they are simple, cylindrical and pointed, and in this state they are known as *spike bucks*; in the following season, they have a short, straight antler; and the number increases until the fourth season, when the following is the most usual condition of the horns: The main stem rises upward and laterally, and then makes a broad curve forward, with the tips turned inward and downward; on the inner and slightly anterior surface of the main stem, arises a short brow antler, directed forward and upward; the stem, thus

far, is roughened by nodosities and furrows; above this, a branch is thrown off from the interior or anterior, curving inwards and forwards, and occasionally another branch before reaching the tip. These first and second branches are occasionally themselves bifurcated; and in one before me now, the horns exhibit six tips on one side, including those of the brow antlers, and on the other nine, the first branch being bifid, the second trifid, a third simple, and the extreme tip itself bifid. When the horn is palmated, the flattening occurs at the origin of the first branch. In many specimens, there is only the brow antler, and a single branch above. Fur composed of flattened angular hairs, lying smooth on the body.

Color. Bluish grey in the autumn and winter, dusky reddish or fulvous in the spring, becoming bluish in the summer. The fawns are irregularly spotted with white. The grey or reddish color in the adult extends over the whole head, back, sides, and upper part of the tail; a few white hairs often observed on the rump, at the origin of the tail. Beneath the chin, throat, belly, and inside of legs and under side of tail, always white. Ears margined with dark brown, and often with white hairs within, and a white circle round the eyes. Hoofs jet black.

Total length (average),	68·0.
Length of tail (including hairs),	6·0.
Height of ear,	4·0.

This well known animal is still found in almost every part of the State, where there is sufficient forest to afford them food and cover. From the mountainous regions of Orange, Rockland and Delaware, the city market is supplied in great abundance during the winter. In the most northerly counties, they are not numerous; and in other counties, the united attacks of men and wolves are daily decreasing their number. Under the article *Wolf*, we have shown how destructive the wolves are to deer. In some insulated districts, as on Long Island, where the wolf has been extirpated, and the deer are placed under the protection of the laws during the breeding season, although more than a hundred are annually killed by sportsmen, yet it is believed that their number is actually on the increase.*

The Deer has one and occasionally two fawns at a birth, which in the southern part of the State occurs in May or June; in the northern districts, somewhat earlier. In the rutting season, the males are restless and bold, and are observed to have the neck considerably swelled. When alarmed, they stamp quickly and often on the ground, and emit a sound like a shrill whistle, which may be heard at a great distance. When mortally wounded, they often give a faint bleat like that of a calf. When brought to bay, it throws off its habitual timidity, its eyes glare fiercely around, every hair on its body bristles up and appears as if directed forward, and it dashes boldly upon its foe. Its horns are cast usually in the winter, but the

* By the present law of the State, deer are only permitted to be killed between the first of August and the first of January ensuing. So many does, however, have been lately killed, with young in December, in the southern parts of the State, that at this session (1842) the project of a law has been introduced, to allow deer to be killed in certain counties only in the months of September, October and November.

period appears to depend much on the latitude, mildness or severity of the season. While growing, the horns are covered with a velvet-like membrane, which peels off as soon as they have attained their growth. It has often been a matter of surprise, that while so many horns are annually cast, so few are ever found. This is to be explained by the fact, that as soon as shed, they are eaten up by the smaller gnawing animals. I have repeatedly found them half gnawed up by the various kinds of field mice so numerous in our forests.

The Deer is an exceedingly useful animal, not only as furnishing an excellent article of food to the settlers in frontier counties, where it would be impracticable to obtain any other meat, but also as furnishing the buckskin of commerce. It feeds on buds and twigs of trees, shrubs, berries and grasses. It appears to be particularly fond of the buds and flowers of the pond-lily.

It ranges from Canada to the Gulf of Mexico, and probably still farther south. I saw two deer alive from Campechy, which were exhibited as Mexican deer, but offered no distinctive characters from those of our common deer. It is found throughout the west to the Rocky mountains. It does not appear to extend into Canada.

THE MOOSE.

CERVUS ALCES.

(PLATE XXIX. FIG. 2)

Cervus alces. LIN. 12 Ed. p. 92.
Moose Deer. PENN. Arct. Zool. Vol. I, p. 17, pl. 8.
C. alces. HARLAN, Fauna, p. 229. GODMAN, Am. Nat. Hist. Vol. 2, p. 274, figure.
American Black Elk. Griffith's Cuvier, Vol. 4, p. 72. Plate of Heads.
The Elk. HAMILTON SMITH, Ib. Vol. 5, p. 303.
Moose Deer. RICHARDSON, F. B. A. Vol. 1, p. 232.
Moose. EMMONS, Mass. Report, 1838, p. 28; for 1840, p. 74.

Characteristics. Blackish grey. Adult male with broad flattened horns. Snout long, prehensile. Neck with a mane. Size of a horse, and largest of the genus.

Description. Stature large. Head long, somewhat narrowed before the eyes, then enlarged into a thick curved nose; the muzzle small. Nostrils long, narrow, enlarged beneath. Eyes moderately large, and placed near the base of the horns; lachrymal pit small. Ears long and asinine. Neck very short, and furnished with a short mane. A tuft of long coarse hair like a beard beneath the throat in both sexes; in the young, this appears like a pendulous gland. Horns in the male only. The first year, it exists in the shape of a short knob, not more than an inch high; in the following year, it is a round spike, slightly directed outwards, and about a foot long; in the third year, they begin to branch forward, and to become palmated above. In full grown adult males, the palmated portion ends in from five to eight short tips; and the brow antlers, if present, are round and pointed, directed forwards, and occasionally bifid or even trifid. Hair coarse and angular, longer upon the neck and withers.

Color. Generally fulvous brown on the upper part of the body, and on the head and sides; this color extends to the upper part of the thighs and fore legs, occasionally extending further down. Ears greyish or dingy white within. Body beneath light colored, with a slight tinge of yellow or soiled white; under side of tail white. In winter, the head, neck and all the upper parts of the body quite dark. Young, sandy brown, unspotted; and this color deepens with age, so that in very aged individuals the color is almost black.

Total length, 6 to 7 feet.	
Length of tail,	10·0 – 16·0.
Height at the withers,	48·0 – 65·0.

The Moose, in its ungainly form and awkward movements, presents a singular contrast to the elegance and graceful motions of the other members of its family. It is known with us under the various names of *Flat-Horned Elk*, *Black Elk*, *Moose*, and *Black Moose;* the name *moose* being a corruption of the Indian appellation *musee*, or *wood-eater*. In the earliest history of our State, the following allusion is made to this animal: "There is also another "kind, which are represented to be large, and about which strange stories are related. I "heard from the mouth of a jesuit who had been taken prisoner by the Mohawk Indians, that "there were many wild forest oxen in Canada and Nova-Francia, which in latin they named "*Boves sylvestres;* as large as horses, having long hair on their neck like the mane of a horse, "but with cloven hoofs, and their habits were not fierce." (*Vanderdonck.*)

In conformity to the doctrine held by many modern naturalists, that few if any quadrupeds are common to the two continents, it has been doubted whether this species is identical with the *C. alces*, or Elk of Europe. I have not had the opportunity, by direct comparison of specimens from both continents, to determine this question; but a careful examination of the descriptions of European writers, with my notes taken many years since from specimens in the collections of Paris and Berlin, satisfies me of their specific identity. Hamilton Smith, whose opportunities for examining our Moose were very great, observes, that "the almost complete "separation of the lower part of the horns into the form of branches, in most if not all the "American specimens, is a very prominent character, while a similar conformation is rare in "those of Europe." In the valuable collection of the Lyceum of Natural History of New-York, are several horns of this species, all without the lower antlers. One pair, which is attached to the skull, and which from its size probably belonged to an aged moose, is equally destitute of lower antlers. This pair is four feet across from tip to tip; the palmated part is thirty inches wide, measured in an antero-posterior direction.

In the summer, the Moose frequents the neighborhood of lakes and streams, frequently swimming in the water, and feeding upon aquatic plants, among which the roots of the pond-lily appear to be most greedily devoured. It also feeds upon the high coarse grasses, twigs of trees, more especially of the striped maple (*Acer striatum*, Pursh), which has consequently received the name of *Moose-wood*. It likewise peels old trees, and feeds upon the bark. Period of gestation, nine months; and it produces one or two at a birth, in April or May.

In winter, the moose herd together for mutual protection, selecting hilly woods, and feeding exclusively on young twigs and the moss and bark of trees. These herds consist of a bull, a cow and two calves; sometimes four or five cows, but this is more rare. Occasionally several of these herds unite, and when the snow lies deep, they will tread down a space of several acres, which are termed by the hunters *moose-yards*. At this season, and in such situations, the hunter attacks them most successfully.

They are yet numerous in the unsettled portions of the State, in the counties of Essex, Herkimer, Hamilton, Franklin, Lewis and Warren; and since the gradual removal of the Indians, they are now (1841) believed to be on the increase. They have been extirpated from Massachusetts, but are still found in Maine, Vermont and New-Hampshire. Godman has erroneously stated that they are not known south of Maine; and this error has been magnified by subsequent copyists, who assert that it is not found in the State of Maine. It existed formerly much nearer the Atlantic coast; for we learn from Dunlap, that a pair of moose were once sent from Fisher's Island to England.

The Moose is a timid, wary animal; and its senses of hearing and smelling are so acute, that it requires the greatest caution on the part of the hunter to approach it. During an expedition of several weeks through the counties of Hamilton, Franklin and Essex, although their tracks were almost daily visible, yet we never had an opportunity of shooting a single individual. A specimen was sent to me from Lewis county, but unfortunately never reached its destination.

The moose furnishes an excellent material from its hide for moccasins and snow-shoes. The best skin is obtained from the bull moose in October, and usually sells for four dollars. They were formerly so numerous about Raquet lake, that the Indians and French Canadians resorted thither to obtain their hides for this purpose; and hence we have the origin of the name of that lake, the word *raquet* meaning *snow-shoes*. They still exist in its neighborhood.

The moose, when pursued, trots off with great rapidity, but in an awkward manner, its hoofs at the same time making a cracking noise. At this gait it soon leaves the hunter far behind, stepping with great ease over fallen timber of the largest size. When hard pressed by the hunters on snow-shoes, if it breaks up into a gallop, they are sure of overtaking it soon. Its flesh is much esteemed, and the meat of the young can scarcely be distinguished from the best veal. The nose and tongue are particularly considered great dainties. The moose, when taken young, is easily domesticated, and has been used in this State for draught. I am not aware, however, that they possess any advantage for such purposes over our common beasts of burden; and their preference for twigs and bark of trees, instead of grasses, would render them not very desirable to the farmer who cared for the growth of his plantation.

The Moose inhabits the northern parts of both continents. In America, they range to the Arctic Sea; and I am enabled to state, from personal knowledge, that their extreme southern limit along the Atlantic coast is 43° 30′ in the State of New-York.

(*EXTRA-LIMITAL.*)

C. macrotis. (RICHARDSON, pl. 20.) Greyish, with a black tipped tail; ears large; horns with three branches; forehead dark brown. About the size of the Common Deer. *Plains of Missouri.*

C. leucurus. (RICHARDSON, p. 258, not figured.) Reddish brown in summer, light grey in winter. Tail long, white beneath and at tip. Size of Common Deer, to which it is closely allied. *Rocky Mountains.*

C. nemoralis. (SMITH, Griffith's Cuv. Vol. 4, plate.) Greyish brown tinged with yellow; forehead and nose black. Horns branched at tip, the anterior branch curved forward like a hook. *Louisiana.*

GENUS ELAPHUS.

Horns in the male only; round, very large, never palmated, furnished with a distinct muzzle. Canine teeth in the males in the upper jaw, sub-orbital; sinus large.

THE AMERICAN STAG.

ELAPHUS CANADENSIS.

PLATE XXVIII. FIG. 2.

Cervus canadensis. RAY, Synops. Quad. p. 84.
C. strongyloceros. SCHREBER, Saugethiere, Vol. 2, p. 1074, pl. 247, F. G.
Alces americanus. JEFFERSON, Notes on Virginia, p. 77.
Elk. SMITH, Med. Repos. Vol. 2, p. 157, figure. (Male, female, young.)
C. wapiti. BARTON, Med. and Phys. Jour. Vol. 3, p. 36. FRED. CUVIER, Mamm. Vol. 2. Male (winter dress)
C. canadensis. HARLAN, Fauna, p. 236. GODMAN, Vol. 2, p. 294, figure. (Male.)
Wapiti. Griffith's Cuvier, Vol. 4, p. 96, plate (male); and Vol. 5, p. 309.
C. strongyloceros. RICHARDSON, F. B. A. Vol. 1, p. 251.

Characteristics. Grey, with a large pale yellowish spot on its rump. Horns large, with large brow antlers. Tail very short. Larger than the common deer.

Description. Body robust, symmetrical, slightly more elevated at the withers than on the hind quarters. Height at the foreshoulders varying from four feet to four feet eight inches. Sub-orbital sinus with a naked triangular space around it. Muzzle broad and black. Ears large and white within. Males with canine teeth in the upper jaw. On the foreshoulder, a short rudimentary mane. Under the throat, there is a sort of dewlap, composed of black hair from four to six inches long. Horns large, with the brow antlers nearly or quite in the direction of the facial line. Females without horns or dewlaps; the tail in both sexes very short.

Color. The variation produced by age or sex is but slight. In the spring, it is of a reddish hue, changing as the summer advances to a yellowish brown; in the autumn, this changes to a buff color, which becomes grey in winter. The rump is pale fawn or yellowish, circum-

scribed by a dark circular marginal line. Limbs on the anterior part deep brown. Chin light-colored. Tail yellowish.

Total length,	84·0 – 90·0.	Length of tail,	2·0 – 4·0.
Length of head,	24·0.	Height,	52·0 – 56·0.

The American Stag has long been confounded with the Stags of Europe. It seems first to have been treated as a distinct species by Ray, in the work cited above. It was then noticed by Jefferson as an elk, but was first fully described and figured by Dr. Smith in the Medical Repository, from living individuals obtained from the State of Maine. It has also, from the popular names applied to it, been confounded with the American Moose just noticed. It is called in various parts of the country, *Red Deer*, *Stag*, *Grey Moose*, *La Biche*, *Wapiti*, *Grey Elk*, and *Round-horned Elk*.

It is surprising that for so large, and in some districts so common an animal, so little is known of its habits. They feed on grass and the young shoots of trees, and are represented as being easily tamed, and have been trained to go in harness. Hearne observes that they are the most stupid of the deer kind, and make a shrill whistling noise, not very unlike the braying of an ass. Other writers, however, represent them as exceedingly astute and wary, exercising great sagacity to avoid the snares of the hunter.

Major Smith, in Griffith's Cuvier, has given the fullest account of the American Stag; but there are a few inaccuracies in that description, which it may not be improper to notice. He describes the horns of a specimen shot on Long Island, with six antlers each, and measuring three feet in length. My friend T. Floyd Jones, Esq., living at Oysterbay, Queens county, has had in his possession for many years a very large pair, sent to him from the west, and it is possibly to these that Major Smith alludes; but there is not even traditionary evidence of its having existed on Long Island since its first settlement by the Europeans.

The Stag is still found in the State of New-York, but very sparingly, and will doubtless be extirpated before many years. Mr. Beach, an intelligent hunter on the Raquet, assured me that in 1836, he shot at a stag, (or as he called it, an elk,) on the north branch of the Saranac. He had seen many of the horns, and describes this one as much larger than the biggest buck (*C. virginianus*), with immense long and rounded horns, with many short antlers. His account was confirmed by another hunter, Vaughan, who killed a stag at nearly the same place. They are found in the northwestern counties of Pennsylvania, and the adjoining counties of New-York. In 1834, I am informed by Mr. Philip Church, a stag was killed at Bolivar, Allegany county. My informant saw the animal, and his description corresponds exactly with this species.

FOSSIL STAG.

ELAPHUS AMERICANUS.

PLATE XXIX. FIG. 1. TOOTH, NATURAL SIZE; HORNS AND POSTERIOR PARTS OF SKULL REDUCED.

Fossil Deer. WISTAR, Am. Trans. Vol. 1, p. 377, New Series, pl. 10, fig. 4.
Cervus americanus. HARLAN, Fauna Americana, p. 245.
Fossil Deer. EMMONS, Mass. Report, 1840, p. 82.

In the Cabinet of the Lyceum of Natural History, New-York, is a portion of a pair of horns attached to a fragment of skull, dug up near the mouth of the Raquet river in this State, near the forty-fifth parallel of latitude. It bears a label in the handwriting of Dr. Mitchill, purporting that it belonged to the *C. tarandus*, or Rein-deer. Its size and appearance indicates a nearer affinity to the *E. canadensis*, or Stag just described. The following comparison was made of this fossil with a gigantic pair of horns of the *E. canadensis*, in the Cabinet of the Lyceum. These latter measured three feet five inches across from tip to tip, and two feet ten inches high from burr to tip in a straight line.

	FOSSIL.	RECENT.
Distance from between the horns to the occipital ridge,	4·1	4·8
Breadth of cranium behind the horns,	4·5	4·6
Ditto above the condyloid processes,	6·0	6·0
Depth across the occipital foramen,	4·4	4·5
Circumference of horn above the burr,	9·6	9·0
From tip to tip, compared with corresponding points on the recent specimen,	40·0	44·0

In the fossil, the horns present the same grooved and ridged appearance as in the American Stag; they rise outward, upward, and slightly backward, then forward and upward. Indications of one or two antlers are evident. The figure in the plate will give a better idea of the appearance and direction of the horns, than a detailed description. Through the carelessness of the engraver, the posterior view of the skull is represented as being of the natural size.

I am unacquainted with the circumstances under which this skull was found, but have ventured to arrange it provisionally with the bones described by Wistar and Harlan in the work cited above. Dr. Emmons has described a tooth, taken from a clay bed in Chautauque county in 1839. It is an old tooth, and is the last on the right side of the upper jaw. Through the kindness of Dr. Emmons, I have been permitted to give a figure of the tooth. The following are its dimensions:

Depth,	1·3.
Transverse diameter of the crown,	1·5.
Shortest diameter,	1·2.

The surface of the crown is too much injured, to enable me to render it with perfect accuracy. I learn that other teeth from the same locality, but larger, are in the Cabinet of Yale College.

I regret that I have had no opportunities of making a direct comparison of this tooth with that of the American stag. A horn of the second year's growth was thrown out by a plough on Grand Isle, which is now in the Cabinet of the University of Vermont, which we also refer to the same species.

DIMENSIONS.

From tip to base in a straight line,	28·50.
Ditto ditto, measured along the curve,	33·50.
Circumference just above the tuberosities,	7·25.
Ditto at the highest part of the curve,	4·50.
Ditto at five inches from the tip,	3·25.

Dr. Emmons appears disposed to consider the relics in question as having belonged to a larger animal than the American Stag, and analogous to the Irish Elk; this, however, is merely offered as a conjecture. In the present imperfect state of our knowledge, I view it as a distinct species, closely allied to the *E. canadensis*.

GENUS RANGIFER.

Horns in both sexes. Canine teeth in both sexes. Muzzle small. Horns slender, smooth, palmated. Sub-orbital sinus.

THE REIN-DEER. (*Extirpated?*)

RANGIFER TARANDUS.

(MEDICAL COLLEGE, ALBANY.)

Cervus tarandus. LIN. Syst. p. 93.
Caribou of the old French writers.
C. tarandus. HARLAN, Fauna Americana, p. 232. GODMAN, Am. Nat. Hist. Vol. 2, p. 283, plate. RICHARDSON, F. B. A. Vol. 1, p. 238, figures. EMMONS, Mass. Report, 1840, p. 78.

Characteristics. Varying in color from deep brown to greyish white. About the size of the common deer.

Description. Body robust, and low on the legs. Snout thin, with oblique nostrils. Ears large. Horns usually slender, very variable in form: They generally consist of brow antlers, which are palmate and digitate; the main stem directed backward, then curving forward, with simple or palmated antlers, or else terminating in a broad palmated expansion, which is often furnished with points. Legs robust. Hoofs rounded, consisting of a single plate folded on itself, very broad, with a strong fringe of hairs around it. Fur close and compact, but composed of two portions, one woolly, the other longer, straight and brittle.

Color. Varying with age and season. Young, brownish above, with a tinge of reddish beneath. Adults, in the summer, in a smooth coat of greyish brown, becoming rougher and whiter in winter. Beneath, the throat, belly and insides white at all seasons.

It is with much hesitation that I include this animal in the Fauna of our State; but the representations of hunters lead me to suspect, that when the yet unexplored parts of the State have been more thoroughly examined, its existence may be disclosed. Pennant, in his time, asserted that the Rein-deer was not found farther south than the most northern part of Canada. Charlevoix, however, saw one killed at Quebec. The specimen in the cabinet of the Medical College at Albany came from Nova-Scotia; and Harlan asserts that it does not pass the State of Maine into the United States, implying its existence there. Prof. Emmons observes, "It is only a few years since this animal appeared in the northern parts of Vermont "and New-Hampshire; from which it is not unreasonable to infer, that in earlier times it may "have passed still farther south." Its gregarious habits and unsuspicious character would seem to ensure its speedy destruction, when placed within the reach of man.

ORDER VII. CETACEA.

Body shaped like a fish. Fore feet two, in the shape of fins. In place of hind feet, there is a broad horizontal fin. Ears consist of a minute exterior opening. Without hair, or a few scattering ones only. Live exclusively in the water, only coming out to breathe. Gregarious.

This order comprises whales, porpoises and dolphins, generally considered by uninstructed observers as fishes. It is divided by Cuvier into two great sections, the Herbivorous and Piscivorous. In the first we find the

FAMILY I. MANATIDÆ.

With two kinds of teeth in the young. Molars with flat crowns. Nostrils placed near the end of the muzzle, in the skin. Long whiskers. Teats pectoral. No spiracle. Scattering short hairs over the body.

Obs. This family comprises about five living species, one of which is found near our shores, but none within the limits of this State.

(*EXTRA-LIMITAL.*)

Genus MANATUS. Grinders eighteen above and eighteen below; the upper square, the lower longer than wide, all with two transverse ridges and a heel, becoming larger on the lower posterior ones. Pectoral fins with vestiges of nails at their edges. Body ending in a rounded caudal fin.

M. americanus. (Pl. 30, fig. 2, A, B; and Pl. 32, fig. 4, Skull.) Body elliptical; snout truncated; skull elongated in proportion to its breadth; lower edge of the lower jaw straight. Tail rounded. Length 10 – 20 feet. *Florida.*

The Manati is still hunted for its flesh, among the keys and lagoons scattered along the southern part of the peninsula of Florida. They are struck with the harpoon. The largest of which I have heard any account, weighed more than a ton. The flesh is highly prized as a savory and nutritive food. The New World of October, 1841, contains an interesting account of the habits of this species; the female is described as having a teat under each swimming paw. Through the politeness of Mr. Bell, I have been permitted to make the following observations on the skull of the Manati, which died a few months after I had drawn up the description cited above. It was a young animal, as was manifest by the existence of the sockets of the incisors in the intermaxillaries of the upper jaw. There were five prominent molars on each side, gradually enlarging behind, and then not yet extruded. In the lower jaw, the teeth were similar in number and position. The curve of the lower jaw (see figure) is nearly as great as in the Senegal species, and almost equals that of the *latirostris.*

M. latirostris. (HARLAN, Med. and Phys. Res. p. 71, plate.) Lower edge of lower jaw curved; snout very wide before the eyes. Length 8 – 10 feet. *Florida.*

M. giganteus. Fossil. (ID. Ib. Vol. 20, p. 385.) Western shore of Maryland.

Genus ZEUGLODON, *Owen.* (Fossil.) Twelve molars in the upper jaw; in the lower, ——. Teeth with double fangs and a horizontal section of the crowns, suggesting the idea of two teeth tied or yoked together; hence the generic name.

Z. harlani. (OWEN, Geol. Soc. Lond. 1838; Loud. Mag. 1839, p. 209. *Basilosaurus,* HARLAN, Am. Phil. Soc. 1834; Med. and Phys. Res. p. 349.) From eighty to one hundred feet long. Occurs in the horizontal limestone of Alabama, the most recent of the cretaceous group; also in Arkansas.

FAMILY II. BALÆNIDÆ.

Teeth none, or only in the lower jaw; when absent, their place supplied above by thin horny plates termed baleen, *or* whalebone. *Skin smooth, and almost entirely destitute of hairs; with a thick mass of fat beneath. Two inguinal teats, placed near the vent. Nostrils assuming the form of spiracles. Gregarious. Piscivorous; often carnivorous.*

OBS. This family comprises the most bulky of created beings. They have a strong external resemblance to fish; and to increase this resemblance, many of them have a callous projection on the back, like a dorsal fin. Upwards of seventeen species have been enumerated by writers, but many of them rest upon uncertain authority. The history of this family

is still enveloped in great obscurity; and their habits, from the nature of the element in which they exist, are little known. They are highly useful to man, producing valuable articles of commerce, and creating an excellent nursery for seamen.

GENUS BALÆNA. *Linneus.*

Head very large. No teeth. Upper jaw furnished with numerous plates of whalebone. Spiracles two, distinct, on the most elevated part of the head, just before the eyes. No dorsal elevation or fin.

THE RIGHT WHALE.

BALÆNA MYSTICETUS.

PLATE XXXI. FIG. 3.

Balæna mysticetus. LINNEUS, Syst. p. 105.
Common Whale. DUDLEY, Phil. Trans. Abridg. Vol. 7, p. 424. SCORESBY, Arct. Reg. Vol. 1, p. 449, figure GODMAN, Vol. 3, p. 98.

Characteristics. Black, occasionally varied with white or yellowish. Gape of the mouth arched with about 600 laminæ of whalebone. Length 40 – 60 feet.

Description. Body thickest in the middle, a little behind the fore paws; somewhat furrowed, tapering towards the tail. Head large, somewhat triangular. Opening of mouth large, with a few scattering hairs on the end of the jaws. Eyes very small, and placed near the corner of the mouth. External ear exceedingly minute. Spiracles two, oblong, adjacent, slightly largish in front. Palate and sides of upper jaw with two rows of whalebone from ten to thirteen feet long, and generally curved longitudinally, and giving an arched form to the roof of the mouth. Each series consists of three hundred laminæ or more of whalebone, the interior edges of which are covered with a hair-like fringe. Swimming paws rounded, somewhat pointed, 7 – 9 feet long, with a width of 4 or 5 feet, and situated about two feet behind the angle of the mouth. Tail very broad, notched in the centre, curved on the edges, and pointed at the tips.

Color. Blackish throughout; occasionally with a small space under the body, and a larger space on the lower jaw, whitish grey or flesh color. Very old individuals become varied with white and black, or piebald.

Weight from 60 to 100 tons.

This huge animal is known along our coast by the various names of *True*, *Right*, *Common* and *Whalebone Whale*. Of its habits little can be said, except that after a presumed gestation of nine months, it produces one at a birth, which it suckles for about a year. The milk is said to be rich and well flavored. It exhibits great maternal fondness for its offspring, and although at other times remarkably timid, manifests great boldness, and even ferocity, in de-

feeding her young. It was formerly found in every part of the ocean in large troops; but since its capture has become an object of commercial enterprise, it has been driven from the shores of Europe and North America, and is now pursued on the coasts of Africa, in the Indian ocean and the Arctic seas. From the structure of its jaws, and the smallness of its throat, it can only feed on the smaller oceanic animals, such as medusæ or sea-jellies, shrimps, crabs, and some minute mollusca. These would at first appear to be insufficient for such huge monsters; but when we examine the waters to which they resort, and which are termed their *feeding grounds*, our wonder ceases. Off the coast of Brazil, I have passed over hundreds of miles where these minute animals were so numerous as to discolor the water, giving it the appearance of wheat scattered over a reddish sand-bank. These are termed by the whalers the *Brazil banks*, and thither they have resorted of late years in pursuit of the whale. Scoresby has estimated, that in similar places in the Arctic seas, twenty-three quadrillions of such animalculæ are distributed over a surface of two square miles.

The whale fishery in this country, as in others, has been pursued with various success, and is even now subject to frequent fluctuations. The first vessel constructed expressly for this fishery, was a small sloop built at Nantucket in 1690. She was merely intended for cruising along shore. In 1715, the number of similar sloops was but fifteen; and from this period it went on increasing up to the war of the Revolution, when it was utterly destroyed by the English.

In 1799,	we employed	26	vessels,	of 5055	tons.
1800,	"	17	"	2814	"
1801,	"	15	"	2349	"
1802,	"	20	"	3201	"

Of this last number, only one was fitted out from this State. It appears also that the business fell off very much from 1790 in the succeeding ten years, as may be seen by the following tables:

1791, we exported 134,595 galls. sperm oil;	1802, we exported 28,470 galls. sperm oil;
447,323 galls. whale oil;	379,976 galls. whale oil;
82,400 lbs. sperm candles;	135,637 lbs. sperm candles;
124,829 lbs. whalebone.	80,334 lbs. whalebone.

The Right Whale was formerly captured in great numbers from sloops and whale-boats, along our whole coast, chiefly from February to May, although they appeared occasionally at all seasons of the year. Along the southern coast of Long Island, whale boats are still kept in readiness; and upon the appearance of a whale, the people in the vicinity quickly assemble, and are soon in pursuit of the animal. The whale fishery, which includes not only this species, but also the Sperm Whale, is pursued in its various branches with great success, either by associations or by individuals. Every person employed is a shareholder, and of course this presents an additional motive for exertion. From a record kept at New-Bedford, which we have inserted below, it appears that the whole number of vessels employed in the

whale fishery, in the year ending September, 1839, was 557, making an aggregate of 169,938 tons, which would give employment to 9,987 men, and to as many more on shore, in the various operations of coopering, refining, etc. etc.

PLACES WHERE OWNED.	Ships and barks.	Brigs and schooners.	Pacific.	Indian ocean.	New Zealand.	South Atlantic.	Atlantic.	In port.	Whole number.	Amount of tonnage.
New-Bedford,	69	8	70	31	27	12	10	27	177	56,118
Fairhaven,	43	1	13	13	7	5	1	5	44	13,274
Dartmouth,	3	....	3	....	....	....	....	....	3	874
Westport,	5	4	....	1	....	....	7	1	9	1,443
Wareham,	2	2	1	....	....	1	1	1	4	904
Rochester,	5	10	....	1	1	....	11	2	15	2,615
Nantucket,	77	4	60	....	3	....	3	9	81	27,364
Edgartown,	8	....	4	....	2	....	1	1	8	2,659
Holmes Hole,	3	1	....	2	....	....	1	1	4	1,180
Fall River,	4	3	1	....	1	1	1	3	7	1,604
Lynn,	4	....	....	3	....	....	....	1	4	1,269
Newburyport,	3	....	....	2	1	....	....	....	3	1,099
Plymouth,	3	....	....	1	....	2	....	....	3	910
Salem,	14	....	2	11	1	....	....	....	14	4,265
Boston,	....	1	....	....	....	1	....	....	1	125
Dorchester,	2	....	2	....	....	....	....	....	2	581
Falmouth,	8	....	8	....	....	....	....	....	8	2,490
Provincetown,	....	1	....	....	....	1	....	....	1	172
Portland,	1	....	1	....	....	....	....	....	1	388
Wiscasset,	1	....	1	....	....	....	....	....	1	380
Portsmouth,	1	....	....	1	....	....	....	....	1	348
Newport,	9	2	5	....	....	3	....	3	11	3,152
Bristol,	5	1	3	....	....	1	1	1	6	1,782
Warren,	18	5	5	2	4	5	1	4	21	6,075
Providence,	3	....	1	....	1	1	....	....	3	1,086
New-London,	30	9	1	13	6	15	....	4	39	11,417
Stonington,	7	5	2	3	1	6	....	....	12	1,912
Mystic,	5	3	....	1	....	7	....	....	8	1,797
Sag-Harbor,	31	....	18	....	3	14	....	2	31	10,605
Greenport,	4	1	1	....	....	4	....	....	5	2,014
New-Suffolk,	1	....	....	....	....	1	....	....	1	274
Jamesport,	1	....	....	....	....	1	....	....	1	236
Bridgeport,	3	....	....	....	....	2	....	1	3	913
New-York,	3	....	....	....	....	1	2	....	3	710
Hudson,	8	....	1	4	....	....	....	3	8	2,902
Poughkeepsie,	6	....	4	....	1	....	....	1	6	2,043
Cold Spring,	2	....	....	....	....	2	....	....	2	629
Wilmington,	5	....	2	....	....	....	....	3	5	1,578
Newark,	1	....	....	....	1	....	....	....	1	366
Total,	498	50	209	89	60	86	40	73	557	169,983

The amount of whale and sperm oil and whalebone introduced into the United States, and the total value of the same at estimated average prices from actual sales during the four years preceding 1839, is as follows :

In 1835,	$6,168,997 00
In 1836,	5,689,814 00
In 1837,	7,357,553 00
In 1838,	6,156,038 00

In this State, the whale fishery has been successfully pursued. From returns obligingly communicated to me by the Collector of the Port of New-York, it appears that within the past year (1838) sixteen vessels of 5538 tons and 320 men, were employed from that port in the whale fishery. The produce was,

Sperm oil, ..	177,346 galls.	Value,	$181,421 00
Whale oil, ..	605,497 galls.	"	209,438 00
Whalebone, .	186,448 lbs.	"	32,124 00
		Total value,	$422,983 00

From the Collector at Sag-Harbor for the same period, I have received the following statement:

Sperm oil, ..	125,240 galls.	Value,	$125,240 00
Whale oil, ..	959,295 galls.	"	319,760 00
Whalebone, .	236,000 lbs.	"	42,480 00
		Total value,	$487,485 00

From another source, we gather the following information connected with the whale fishery from one district alone in this State. It is the district which comprises the three counties of Kings, Queens and Suffolk, on Long Island.

During the year ending December 31, 1840, there arrived within that district, between the second of May and the twelfth of October, nineteen vessels, with the following gross amount:

Sperm oil,	109,588 galls.
Whale oil,	937,234 galls.
Whalebone,	232,182 lbs.,

valued at something over half a million of dollars.

During the year 1840, between June 16 and December 20, there sailed from the same district twenty vessels. Their destinations were, fourteen for the South Atlantic Ocean; two for the Indian Ocean; and for New-Holland, New-Zealand, Crozett Islands and the North-west Coast, one each. On the first of January, 1841, there were still absent, in addition to the foregoing, nineteen vessels, all on voyages to the Indian Ocean and New-Zealand. These had departed between the twelfth of June, 1838, and the twenty-sixth of August, 1839. Several of them, however, arrived within the present year. The average duration of those whalers which returned in 1840, was short of sixteen months.

Those vessels employed in the right whale fishery, are absent on an average twelve months. In pursuit of the spermaceti whale, the duration of the voyage often extends to three years.

From more recent information, we are enabled to state, that at the close of the year 1841, our whaling squadron, out of all the States, amounted to 650 sail of all classes, presenting an aggregate tonnage of 190,374, and employing 13,500 men in the actual prosecution of their voyages.

GENUS PHYSETER. *Gmelin.*

Head enormously large, truncated in front. Twenty or more stout, conical, subequal teeth on each side of the lower jaw, rudimentary above. Spiracles united into one, near the end of the jaw.

This genus is remarkable, not only for its bulk, but for the valuable article of commerce, termed *spermaceti*, which is found chiefly in large cells in the upper part of the head. Seven species have been enumerated by compilers, but we shall follow Cuvier in considering but one species as yet sufficiently identified. We prefer retaining the original name of *Physeter*, to the barbarous provincial epithet of *Cachalot*.

THE SPERM WHALE.

PHYSETER MACROCEPHALUS.

PLATE XXXI. FIG. 2.—(JAWS IN THE CABINET OF THE LYCEUM.)

Cachalot macrocephale. LACEPEDE, Hist. Nat. Cet. pl. 10, fig. 1.
Physeter macrocephalus. SHAW, Gen. Zool. Vol. 2, p. 49.
The Spermaceti Whale. Naturalist's Library, Vol. 6, p. 154.

Characteristics. Black or darkish above; throat and beneath, silvery grey. A very small dorsal elevation towards the tail. Length 60 – 80 feet.

Description. Head forming one-third of its bulk; its anterior part truncated or obtuse, overhanging the lower jaw. Eyes small, and said to be unequal. Spiracle shaped like the letter *f*, on the anterior part of the head, in the centre of an elevated protuberance. Swimming paws short, obtusely pointed. Openings to the ear sufficiently large to admit a small quill. Teeth in the lower jaw conical, pointed, not acute; in some individuals, amounting to twenty-seven. In the upper jaw there are also teeth, but very small and rudimentary. The lips overhang and conceal the opening of the mouth.

Color. Generally brownish black or jet black, somewhat lighter on the sides, and beneath a silvery grey. There is often a considerable variety in their markings, but the old males are generally light grey on the anterior part of the head.

The Sperm Whale is gregarious, and often found in herds of from two to five hundred. They are said to feed on fish, and a species of sepia or cuttle-fish. Although they resort to the same feeding grounds with the Right Whale, it is not probable that, with their large teeth and powerful jaws, they subsist on the same minute food. The sperm oil is found in great

abundance in a large cavity in the upper part of the head, above the brain. It is also obtained from the blubber, which varies in thickness from eight to fourteen inches. A moderate sized whale will yield fifty to eighty barrels. In a few rare cases, we have known them to furnish one hundred and twenty barrels.

Although a timid animal, the Sperm Whale will sometimes turn with fury upon its pursuers, and destroy boats and men. Upon one occasion, a large whale attacked the whale-ship Essex, stove in its bows, when she filled and sunk; the crew took to the boats, and after unheard of suffering, landed on the coast of Peru; three only of the crew survived.

The Sperm Whale was formerly numerous on our coast, where it is still occasionally captured. Sixty years ago, the pursuit of the whale was considered so characteristic of American hardihood and enterprise, as to have elicited from the English orator BURKE the following eloquent tribute: "While we are carrying on the whale fishery under the arctic circle, we hear "that they have pierced into the opposite region of polar cold; that they are at the antipodes, "and engaged under the frozen serpent of the south. Falkland Island, which seems too remote "and too romantic an object for the grasp of national ambition, is but a stage and resting place "for their victorious industry. Nor is the equatorial heat more discouraging to them than the "accumulated winter of both poles. We learn that while some draw the line or strike the "harpoon on the coast of Africa, others run the longitude, and pursue their gigantic game "along the coast of Brazil. No sea but what is vexed with their fisheries; no climate that "is not witness of their toil. Neither the perseverance of Holland, nor the dextrous and firm "sagacity of English enterprise ever carried this most perilous mode of hardy industry to the "extent to which it has been pursued by this recent people; a people who are still in the "gristle, and not hardened into manhood." Since that period, how extended the field of our labors! The broad Atlantic has become too limited an arena for exertion. A new antarctic continent has been discovered and coasted, among the thick-ribbed ice. The Gallipagos, New-Zealand, the Coast of Japan, are but resting places, and the farthest limits of ocean only, bound the ardor of our daring navigators.

GENUS RORQUALUS. *Knox.*

Head not disproportionately large. Jaws somewhat pointed, and rostrated. An acute protuberance on the back, resembling a dorsal fin. No teeth. Short baleen in the upper jaw. Deep folds on the throat and abdomen.

THE BEAKED RORQUAL.

RORQUALUS ROSTRATUS.

PLATE XXX. FIG. 1.

Balæna rostrata. FABRICIUS, Faun. Grœnland. p. 40.
Balænoptera acuto-rostrata. LACEPEDE, Cet. p. 134, pl. 4.
B. rostrata. SCORESBY, Arct. Regions.
Rorqualus minor. KNOX, Nat. Lib. Vol. 6, p. 142, pl. 7.

Characteristics. Bluish black; greyish white beneath, with numerous flesh-colored folds on the throat and belly. Baleen white, divided into 320 plates on each side. Vertebræ 48. Length 16 – 25 feet.

Description. Body cylindrical, and gently tapering from the swimming paws to the head and tail; towards the tail the body becomes much compressed, and forms a ridge which runs a few inches on the tail. Head smaller than the body, long, narrow and pointed; the outline of the head separated from the dorsal outline by a slight depression. The upper mandible, from the commencement of the baleen, is 42·0 long, and 4·0 shorter than the lower, into which it is received; furnished with baleen of a whitish color, which has a hoary appearance on its fringed edges. The laminæ, as nearly as could be ascertained by repeated countings, amount to three hundred and twenty on each side; they were of various lengths, from two to eleven inches, gradually increasing from the snout posteriorly. The spiracles two, placed at the extremity of the ridge on the upper jaw, a little forward of a line drawn upwards from the eyes: They are 7·0 long, and gradually approach each other to within 0·75 in front; posteriorly they are 3·0 apart, and are separated from each other by a deep furrow 9·0 long. Lower jaw acute, rather stouter, and 4·0 longer than the upper. Eyes large, but appear small, as they are much covered by the eyelids; a deep furrow above and beneath, placed above and near the angle of the mouth. The ears not visible, but their situation is determined by a very slight change in the appearance of the skin, which yields rather more than the surrounding parts to pressure; they are about 5·0 behind and a little below the eyes. Tongue large, free and very fat; beneath it the skin of the throat is very dilatable. Roof of the mouth smooth. No vestige of a tooth could be seen or felt in the lower jaw. Swimming paws 25·0 long, oblong, tapering, and attached vertically to the body about two-thirds of the distance from the dorsal protuberance to the angle of the mouth. (In the figure this is incorrectly given.) Dorsal eminence leathery, elastic, triangular, a foot high, broad at the base, and placed above the vent. Tail horizontal, bilobate, its tips pointed. Chin and throat with numerous furrows 0·5 to 1·0 deep, extending some distance over the abdomen, and presenting a waved appearance on the chin and throat.

Color. Bluish black above, pearly white beneath, but this has changed to a faint pink, especially in the furrows, owing, I imagine, to the settling of the blood in those parts. Lips white. Swimming paws white in the middle, black at the base and extremities. Under side of the tail whitish.

Dimensions. Total length eighteen feet. From the posterior fold of the swimming paw to the notch in the middle of the tail, eleven feet six inches. Girth at the swimming paws thirteen feet. Tail seventeen inches deep, and four feet nine inches across from tip to tip.

I had no opportunity of determining its sex, but was informed that it was a female.

The above description was taken from a whale captured in the lower bay of New-York in 1822.

THE NORTHERN RORQUAL.

RORQUALUS BOREALIS.

Balæna tripinnis maxilla inferiore rotunda. SIBBALD, Phalainologia, Tab. 3.
Balæna boops, Lacépède. MITCHILL, Med. Repos. Vol. 7, p. 416.
Broad-nosed Whale. SCORESBY.
Rorqualus borealis. KNOX, Nat. Libr. Vol. 6, p. 125, pl. 5.

Characteristics. Baleen divided into four or five thousand plates. Larger than the preceding. Vertebræ 65. Length 50 – 105 feet.

Description. Body not cylindrical, but compressed on the sides, and angular on the back. Head smaller than in *Balæna*. Dorsal elevation very small, triangular, opposite to the vent. Swimming paws placed far back, long, slender, and pointed at the tips. Baleen 314 plates on each side, extending about fifteen inches, and succeeded by a great number of smaller plates, gradually changing to bristles. Vertebræ 65. The largest vertebræ are 14 inches in the diameter of their bodies, and from 6 – 7 feet from tip to tip of their transverse processes.

Color. Uniform black above, light beneath. Folds pale white, occasionally reddish.

These two species resemble each other so much as to have been confounded together, until the careful examination and comparison of two recent specimens enabled Dr. Knox to establish their specific differences. The species is introduced here upon the authority of Dr. Mitchill, who has furnished a very brief notice of a large whale exhibited in New-York in 1804. It grounded, and was captured near Reedy Island in the Delaware. The following is all the information furnished: "Length 38 feet; circumference 18 feet; expanse of the jaws at the "extremity, 8 feet. No teeth in either jaw. Whalebone one to two feet long in the upper "jaw, of a grey hairy appearance." This is very meagre, but is enough to indicate that it should probably be referred to the above species. That it was clearly not the young of the Right Whale, *B. mysticetus*, is manifest from the absence of a dorsal elevation, which led Mitchill to refer it to the *B. boops;* while its size and the peculiar appearance of the baleen, would lead us to arrange it under the present species. It was a young individual.

(*EXTRA-LIMITAL.*)

Rorqualis australis. In 1837, the skull of a large whale was exhibited in New-York, under the imposing name of "Fossil Head of the Sea Serpent." It was reported to have been dug up near the Balize, Louisiana, and was in the condition of a graveyard bone. It had been probably stranded,

and subsequently covered by the rapidly forming sediment of the Mississippi. The lower jaw was wanting. The skull, with the upper jaw, was perfect, and measured fifteen feet. After a careful examination and comparison, it was identified with the *Rorqualis australis*, or *Balænoptera* of the Cape of Good Hope, described and figured by Cuvier (Oss. Foss. Vol. 5, part 1, p. 370, pl. 26, figs. 1, 2, 3, 4). A reduced figure, from a larger one taken on the spot, will be found on Plate 33, fig. 4.

FAMILY III. DELPHINIDÆ.

Teeth in both jaws, often numerous. No baleen. Other characters in common with the preceding family. Gregarious.

Obs. Sixteen species, included under seven genera, belong to this family. They are generally small, but some of them equal in bulk the largest of the preceding family.

GENUS GLOBICEPHALUS. *Lesson.*

Head globular; the rostrum not produced. Mouth subterminal, beneath. A dorsal eminence resembling a fin. Spiracle single.

Obs. This small group contains at present two living and one fossil species. On our coast, we have frequently

THE SOCIAL WHALE.

GLOBICEPHALUS MELAS.

PLATE XXX. FIG. 3.

Delphinus melas. Traill, Nicholson's Journal, Vol. 22, p. 81, 1809, figure.
D. globiceps. Cuvier, Mem. Mus. Vol. 19, p. 1, 1812, figure.
D. deductor. Scoresby, Arct. Regions, Vol. 1, p. 496, figure.
D. intermedius. Harlan, Ac. Sciences, Vol. 6, p. 51, pl. 1.
Phocena globiceps. Sampson, Am. Journal, Vol. 23, p. 301, figure.

Characteristics. Uniform black above; lighter beneath. Teeth varying from 18 – 28 in each jaw. Swimming paws long and pointed. Length 15 to 20 feet.

Description. Body cylindrical, tapering to the tail, and ending in front in an obtuse globular head. Upper jaw somewhat advanced before the lower. Teeth equidistant, sharp, conical, incurved at the point, the largest eight inches in length; they are not apparent in the young, and appear to vary in number with age. In an adult specimen, they were 28 in each jaw. Spiracle single, and placed on the back of the head. Sides of the tail carinated; the tail itself strangulated at the base. The dorsal eminence triangular, broad at base, sixteen inches high, immovable, and placed six feet from the mouth. Swimming paws long, narrow and tapering, sixteen inches in length.

Color. Shining, bluish black above. A narrow space extending from the throat to the vent, of a light grey color.

Length twenty feet.

The dimensions here given, were from an adult of the largest size. This cetaceous animal, so remarkable for its loud cries when excited, has received in our country various popular names. It is called *Black Whale-fish*, *Howling Whale*, *Social Whale*, and *Bottle-head*. It resembles the Grampus in size, and is probably often confounded with it. It appears to have been first noticed by Egede in his History of Greenland, and subsequently figured by Duhamel (Hist. Poiss. pl. ix. fig. 5). They are often seen in large herds, which, from some cause as yet unexplained, are frequently stranded, and perish on the coast. The books are full of instances of such occurrences on the shores of Europe, more particularly in the high northern latitudes. At Wellfleet, near Cape Cod, in 1822, a herd of one hundred of these social whales, varying in length from ten to fifteen feet, were stranded and captured. In the cotemporary newspaper notices, it was stated that they had been formerly numerous on that coast, but had not appeared there for many years. In September, 1823, a single one was taken in Salem harbor, and described by Dr. Harlan as *Delphinus intermedius*. In October, 1832, another individual came ashore at Fairfield beach, Connecticut, and was described by Mr. Sampson. In 1834, I received an account of the capture of two others on the east end of Long Island. The details furnished on that occasion enabled me to refer them with exactness to this species.

GENUS PHOCÆNA. *Cuvier.*

Head rounded, not much elevated. Mouth terminal. Snout short and rounded. Teeth varying in number. Dorsal eminence as in the preceding. Usually of a small size. Gregarious. Piscivorous.

THE COMMON PORPOISE.

PHOCÆNA COMMUNIS.

Delphinus phocæna. LINNEUS. GMELIN.
Porpesse. PENNANT, Brit. Zool. Vol. 3, p. 93.
D. phocæna. DESMAREST, Mammalogie, p. 516.
Sea Swine. GODMAN, Am. Nat. Hist. Vol. 3, p. 69.

Characteristics. Under jaw slightly longest. Twenty to twenty-five teeth on each side in both jaws, straight, compressed, and rounded at the tips. Length 4 to 5 feet.

Description. Body elongated, tapering towards the tail. Skin smooth. Snout short and obtuse. Eyes small, and placed behind the angle of the mouth. Auditory hole very small. Spiracle single, on the top of the head over the eyes, crescent-shaped, with its concavity

directed forward. Dorsal eminence broad, triangular, and nearly in the centre of the body. Swimming paws placed very low down, moderate, oval and obtusely pointed. Tail lunated.

Color. Dusky bluish black above; whitish beneath, the two colors meeting on the sides. Swimming paws of the color above.

Length four to five feet.

The Porpoise, or Porpess, is common in our rivers and bays, chiefly in the spring and summer months, when they appear in the train of the migratory *Clupidæ*, among which they make great havoc. This species has been confounded with another cetaceous animal of the same name, which is very rarely seen unless in the ocean off soundings. We allude to the *Delphinus delphis*, or *Sea porpess*, the Dolphin of the ancients. The common porpoises were formerly so abundant on the shores of Long Island, as to have induced the inhabitants to form establishments for their capture. In the Transactions of the Society in the State of New-York for the promotion of Agriculture, Arts and Manufactures, 4to. N. Y. 1792, will be found a paper by E. L'Hommedieu, on the manner of taking porpoises at the east end of Long Island. A seine is prepared about five hundred feet long, with cords about the size of ratlin stuff; the meshes are about nine inches square, and the seine from twenty to thirty feet deep. Tight casks of the size of ten gallon kegs, are used as buoys. The seine is then set parallel with the shore, at the distance of eighty rods, and secured by anchors at each end. Two other seines are made of large codline, with the meshes six inches square. These are put in separate boats on the shore, opposite each end of the larger seine. Porpoises go in scholes, and in following the small fish, come between the shore and the great seine. As soon as they reach the middle of the seine, the boat at the far end heads them off, throwing out the light seine from the shore to the end of the great seine, to which it is fastened; when both are thus fastened, and the anchors raised, the porpoises are imprisoned. Opposite the great seine, and parallel with it, on the shore, stout stakes are driven in about three rods apart, and a capstan placed at each. The small seines are drawn in, and the boats are sent outside. As soon as the porpoises find themselves confined, and the water becomes shoal, they throw themselves against the bag of the seine with so much force, that it is necessary to ease the capstan to prevent the ropes parting. As soon as this is over, they do not make a second attempt, but become so gentle that the men wade in among them, and put a slip-noose over their tails, or secure them with harpoons, and drag them ashore: there they are all speedily despatched. The blubber, for which they are principally sought, varies from one to two inches in thickness, and yields upon an average six gallons of oil per porpoise. The blubber is cut through on the back and belly, and is peeled off in halves; it is then scraped off with an instrument resembling a currier's knife, and the skin sent to the tanner. The leather made from this skin is said to be the strongest known, and is used more particularly for the upper leather of boots and shoes.

The word *porpoise*, or *porpesse*, comes to us from the Latin through the French, *Porc-poisson*. *Grampus* has a similar origin.

THE GRAMPUS.

PHOCÆNA ORCA.

PLATE XXXII. FIG. 1. LOWER JAW AND TOOTH.

Delphinus orca. FAB. Faun. Grœnl.
Killers. DUDLEY, Phil. Trans. 1719, p. 256; Abridg. Vol. 7, p. 424.
D. gladiator et *orca.* LACEP. Vol. 15, p. 1. BLOCH, Poiss. Vol. 10, p. 93 and 96.
Grampus. HUNTER, Phil. Trans. 1787, pl. 16.
Grand-poisson, Grapois and *Grampus,* of the Normans and English.
Killer and *Thrasher,* of the American sailors.

Characteristics. Upper jaw longest. Teeth conical, bent at their tips; eleven on each side, above and below. Length 20 – 25 feet.

Description. Body thick in proportion to its length, oval. Snout short and obtuse. Lower jaw broader than the upper. Teeth unequal, varying in number with age, but usually twenty-two in each jaw, and larger than in any other species of this genus. In the right side of a lower jaw which I had an opportunity of examining, the teeth were four inches long, and projected two inches beyond the sockets; the upper portion conical, with blunt points directed inward and backward; the lower portion just above and within the sockets, compressed transversely, one and a half inches in diameter, in the other direction not exceeding one inch: all the teeth contracted at their bases. The dorsal elevation, miscalled a fin, is placed nearly on the middle of the body, pointed at the tip, and nearly four feet high. Swimming paws broad and oval. Tail lunate.

Color. Glossy black above; white beneath, the two colors separated by a well defined but irregular line. Occasionally a round or oblong patch of white above or behind the eye.

Length, 20 – 25 feet.

The Grampus, Finner or Black-fish Whale, under which different names it is known to our fishermen, was formerly numerous on our coast, when the Right Whale was also abundant. I have seen them off the coast of Long Island, on several occasions. Paul Dudley, in an essay on the Natural History of Whales, in the English Philosophical Transactions, notices this species as the natural enemy of the whale: "Our whalemen have given this fish the "name of *Killer.* These killers are from twenty to thirty feet long, and have teeth in both "jaws, that lock one within the other. They have a fin near the middle of the back, four or "five feet long. They go in company by dozens, and will set upon a young whale, and will "bait him like so many bulldogs." The grampus is doubtless a voracious animal, living upon various large fish, and even seals and porpoises have been found in their stomachs; but the stories of their attacking whales in packs, will perhaps require confirmation by competent authority. They are very sportive in their habits; and perhaps a large herd of them together, engaged in chasing and tumbling over each other, may have suggested to the lovers of the marvellous the idea of being occupied in attacking a whale. The grampus furnishes an excellent oil.

GENUS DELPHINUS. *Linnæus.*

Head more or less rounded, and separated from the elongated beak by a distinct furrow. Teeth numerous. Dorsal eminence as in the preceding.

THE SEA PORPOISE.

DELPHINUS DELPHIS.

PLATE XXXI. FIG. 1.

Delphinus delphis. LINNEUS, 12 Ed. p. 108.
D. delphis. DESMAREST, Mammalogie, p. 514.
The True Dolphin. GODMAN, Am. Nat. Hist. Vol. 3, p. 58.

Characteristics. Teeth forty to forty-eight on each side, above and below, slender, subequal, slightly bent, pointed. Length 6 – 8 feet.

Description. Body cylindrical, tapering, with a smooth, hard coriaceous skin. Eyes small, low down, and near the angle of the mouth. Spiracle single, on the summit of the head, above the eyes. Beak the length of the head. Teeth subequal, equidistant, interlocking with each other, somewhat larger towards the posterior part of the jaw. Swimming paws placed low, longer than broad, half way between the end of the beak and the dorsal eminence, subfalcate. Dorsal eminence triangular, curved backward, ten inches high, and nearly the same at base. Tail lunate, with two long pointed lobes.

Color. Dark greenish black above; white beneath, and greyish on the sides.

Length 6 – 8 feet.

The name of *Dolphin*, which is applied to this animal, is also given by sailors to a species of fish. This is the true Dolphin of the ancients, concerning whose docility and fondness for music such marvellous stories have reached us. I am indebted to Mr. Audubon for an opportunity of presenting the accompanying figure, reduced from a sketch made by him of an individual six feet long.

The Sea Porpoise is generally seen in large herds. Upon one occasion, I saw during a storm a troop of these animals. They swam abreast of each other, and the line extended nearly a mile. Their movements, as they sprang over a wave, were very beautiful. They are exceedingly ravenous, living upon all the gregarious tribes of fishes. They rarely approach soundings, unless in pursuit of their prey.

(*EXTRA-LIMITAL.*)

D. calvertensis, Harlan. (Fossil.) From the Maryland tertiary. (See Bulletin Nat. Instit. Washington, No. 2.)

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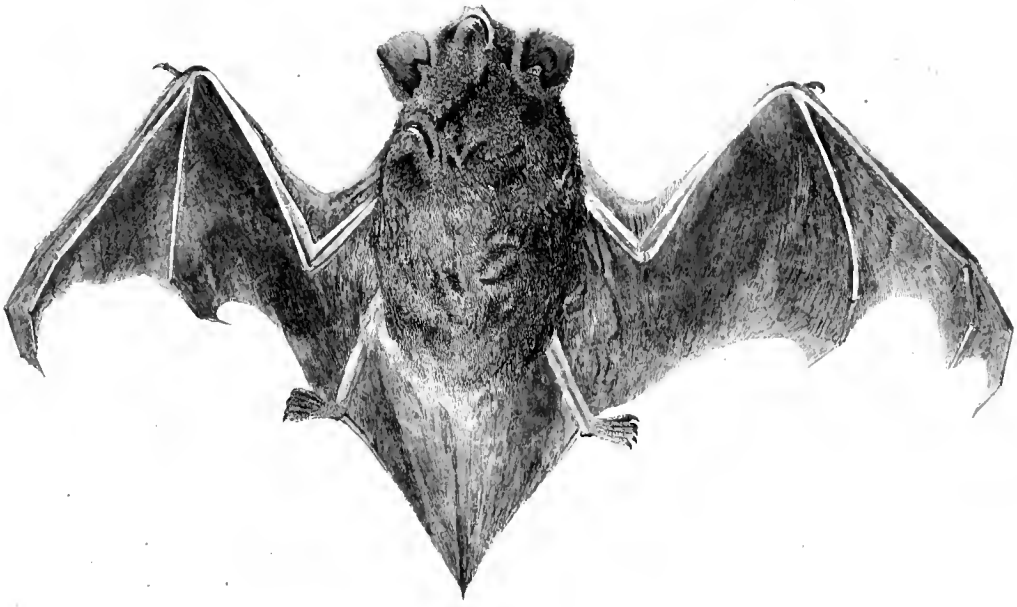

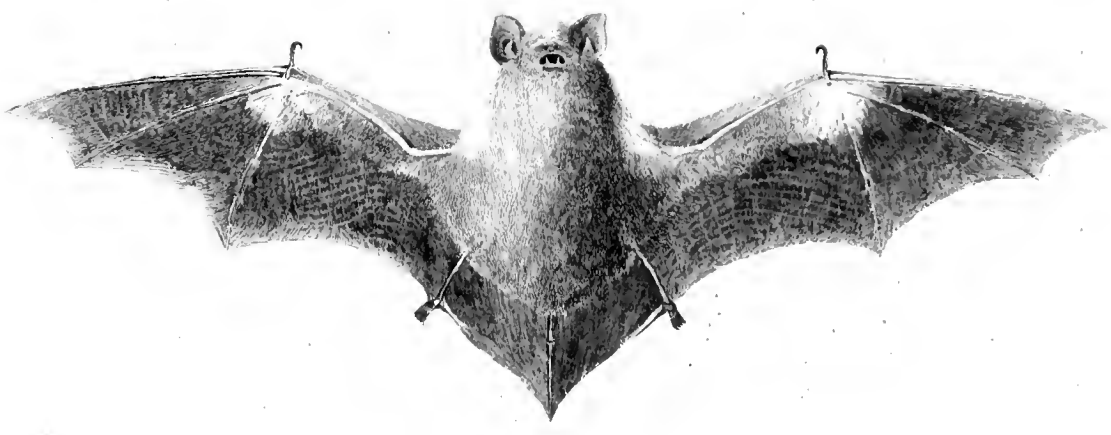

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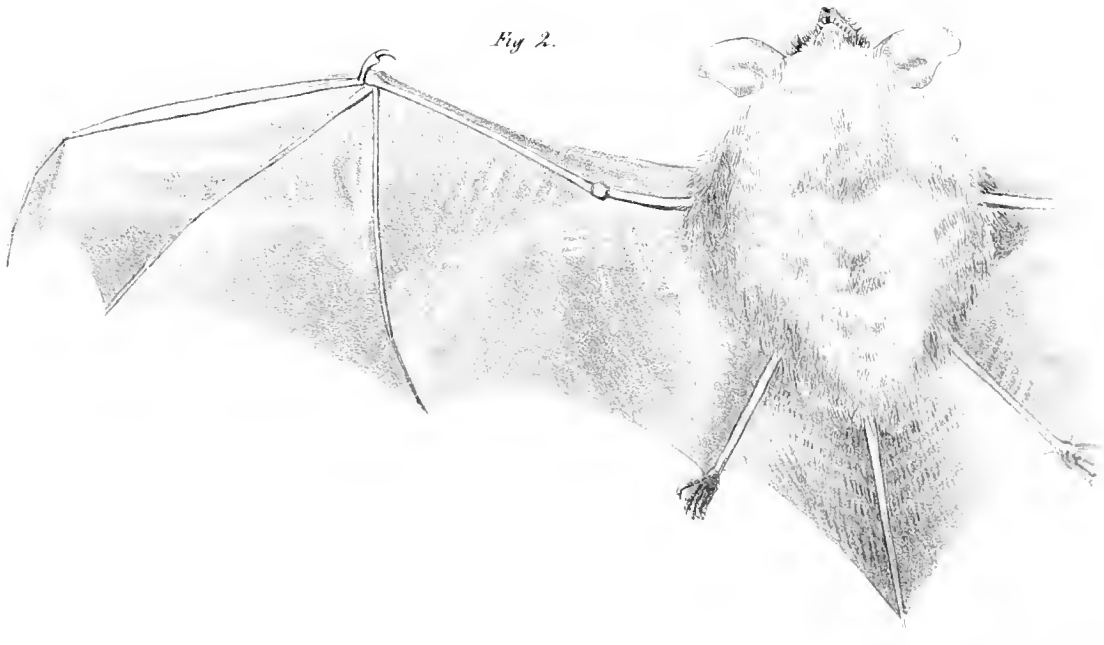
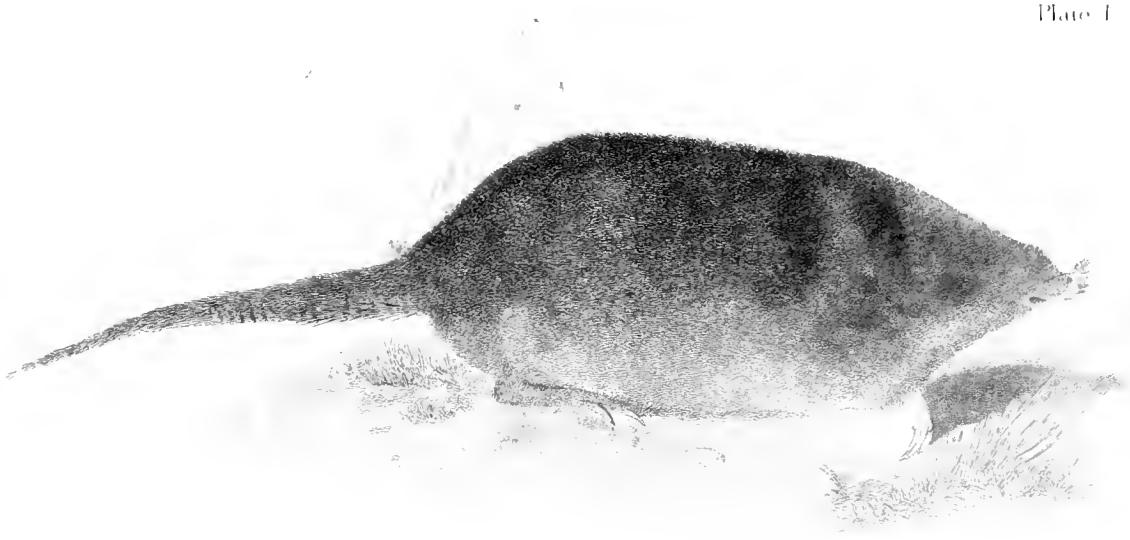


J W Hill

Lith of Endicott New York



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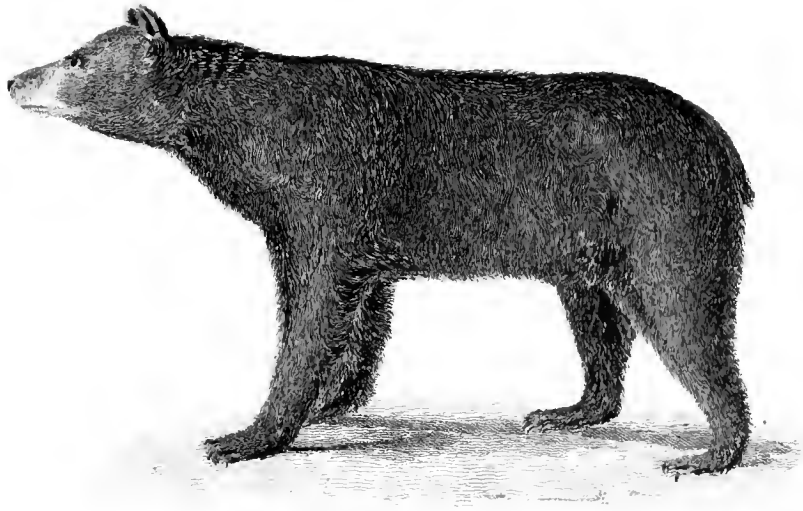

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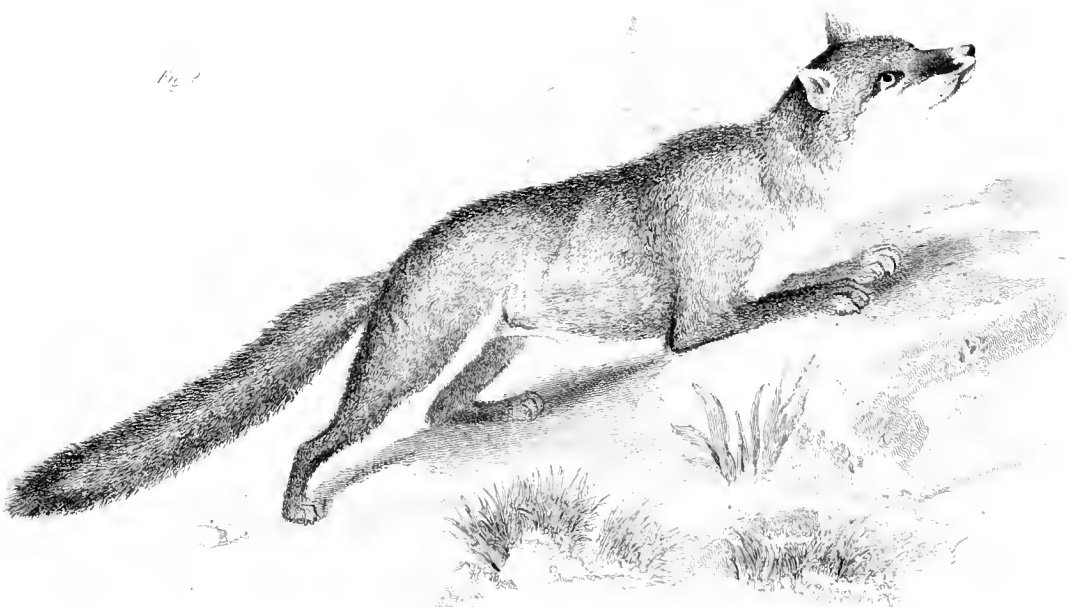

Fig 1 a

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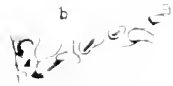
Fig 2 a

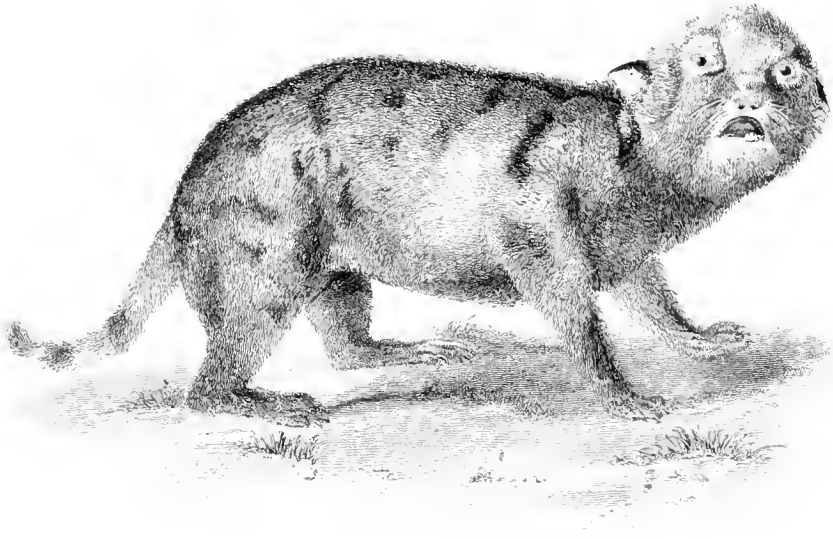
b

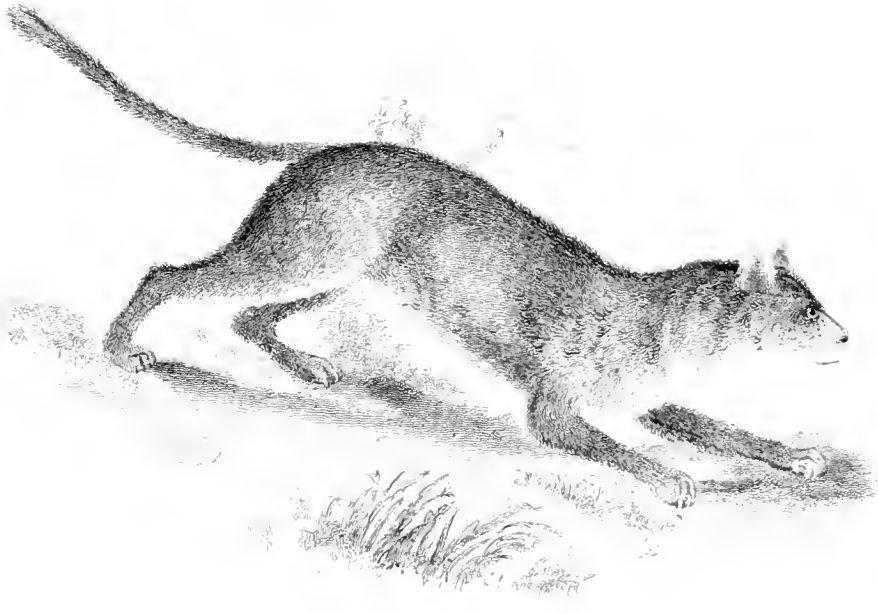
c

Fig 3 a

b







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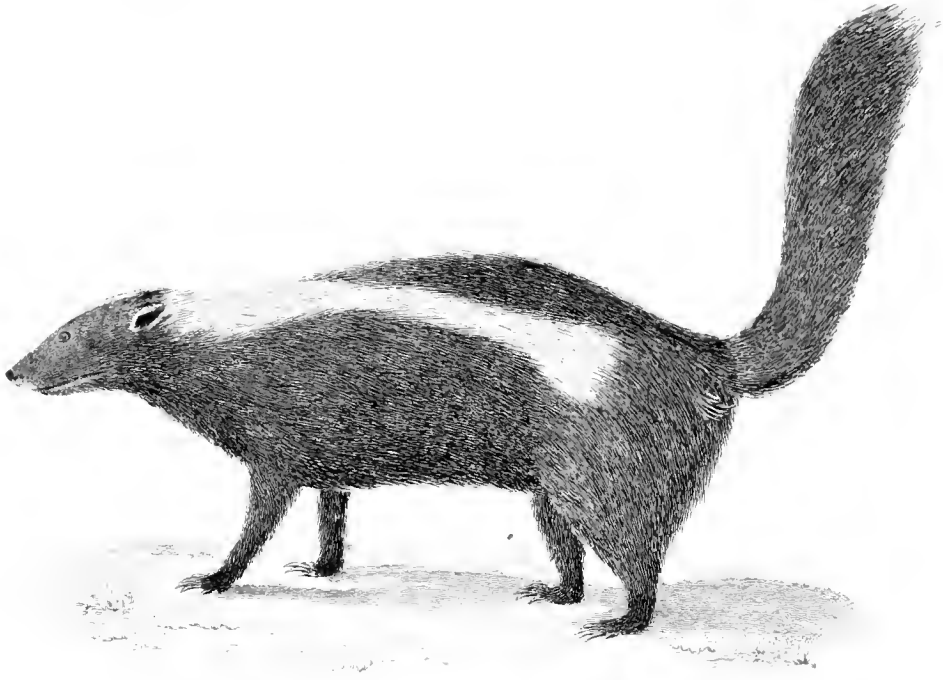

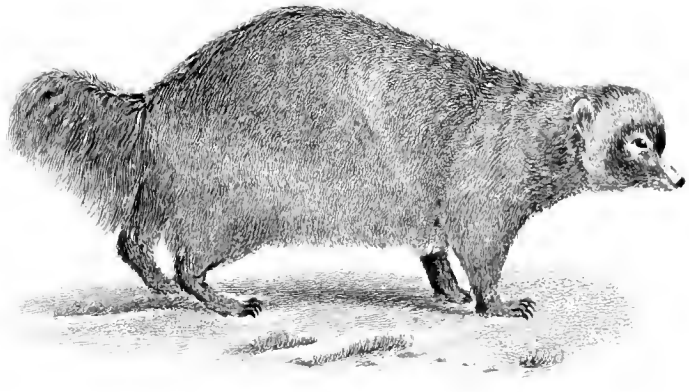

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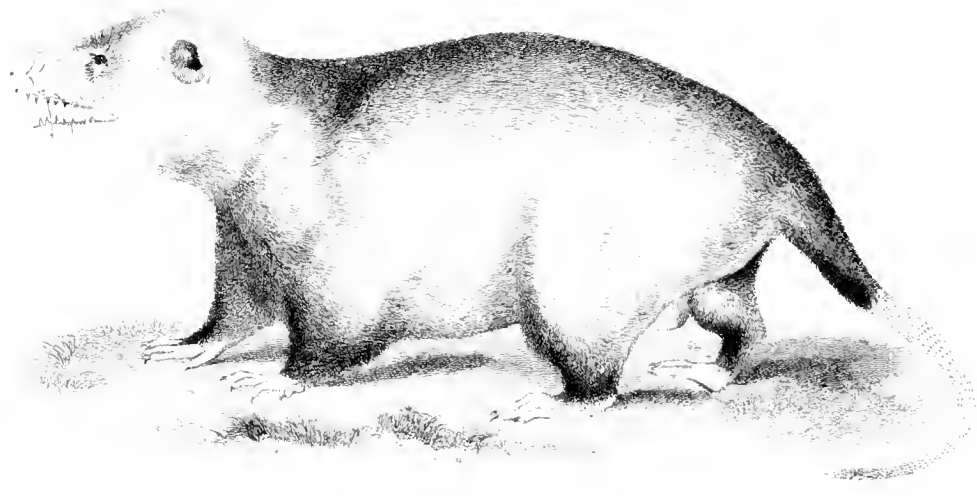

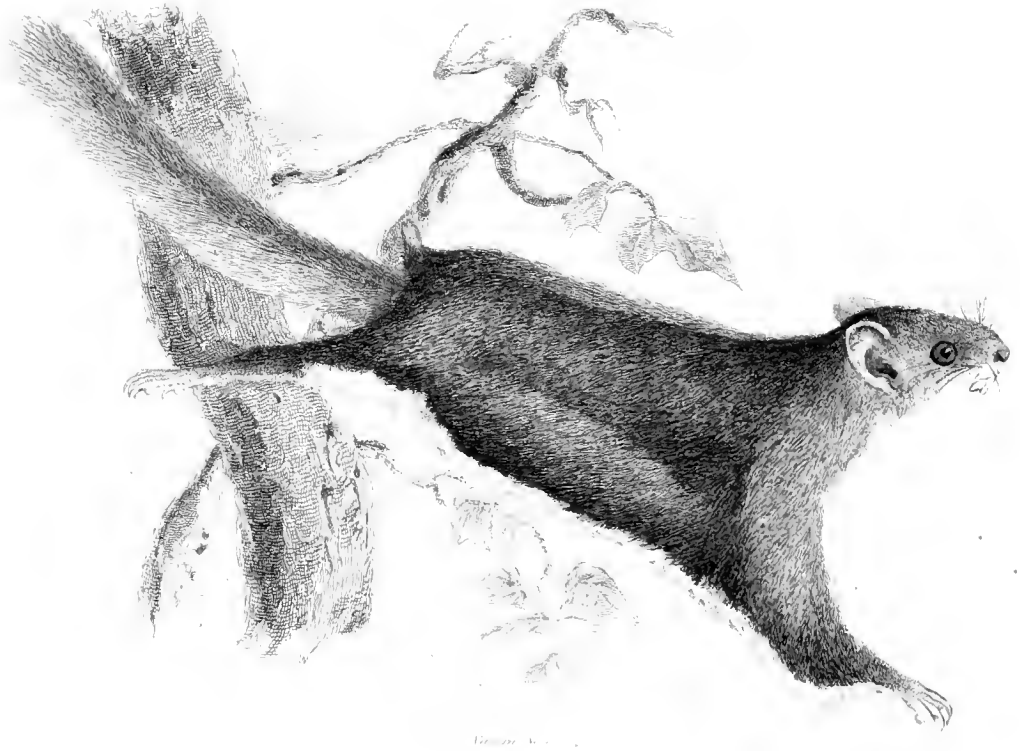

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Fig 1

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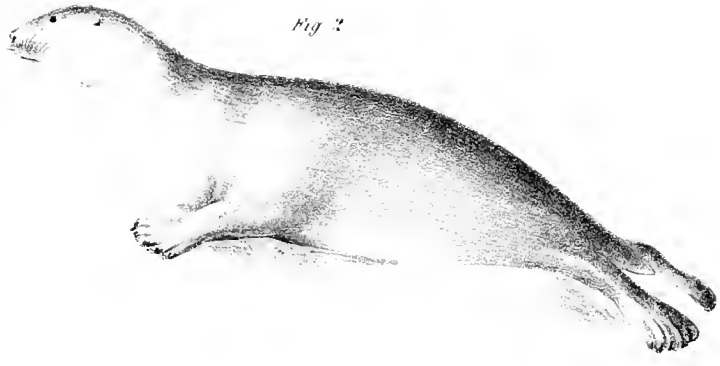
Fig 2



2. Nat size

Fig 3

2.5. Nat size

Fig 5 a

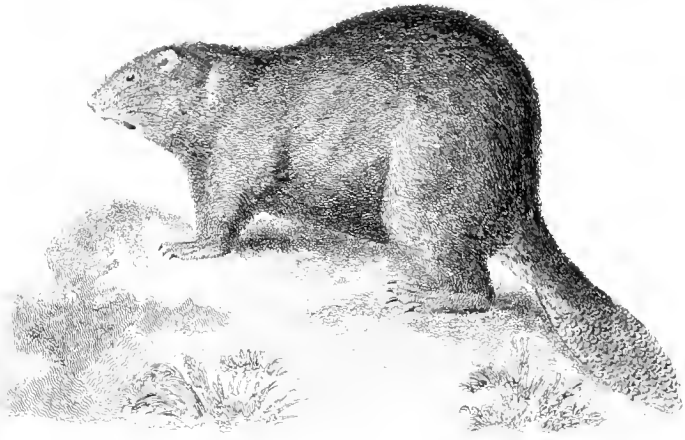
Plate 15.

Fig 2

Fig 1 a

J.W.

Lith of Endicott New York



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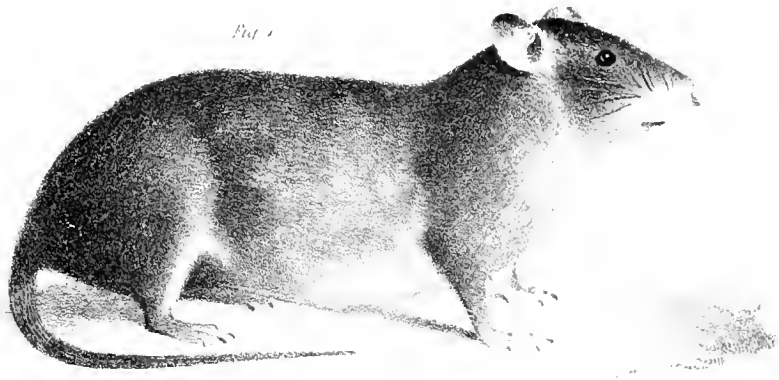

Fig 1

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Fig 2

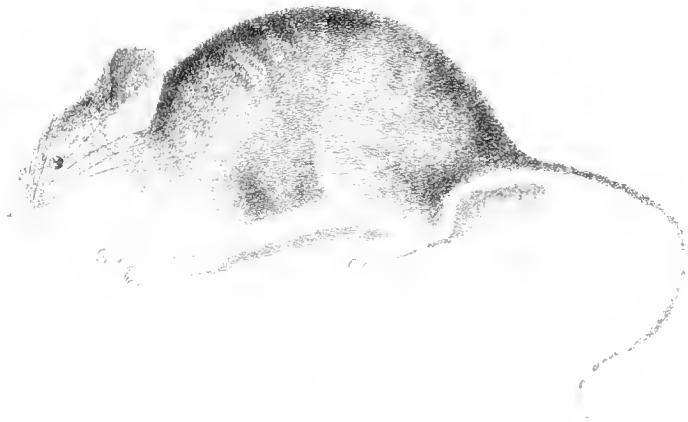
Fig 3

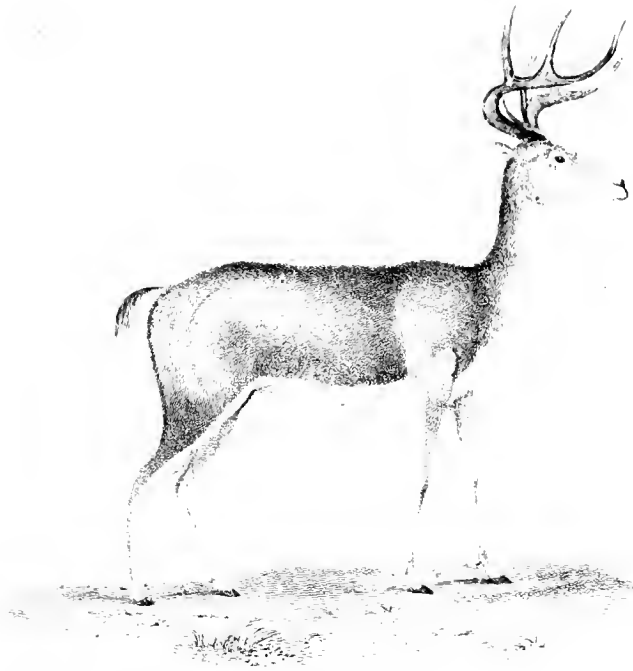
Fig 4

1/3 Nat size

Fig. 1

Fig. 2





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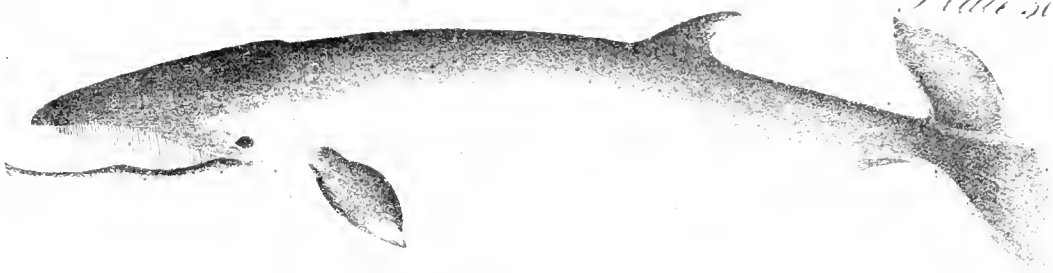
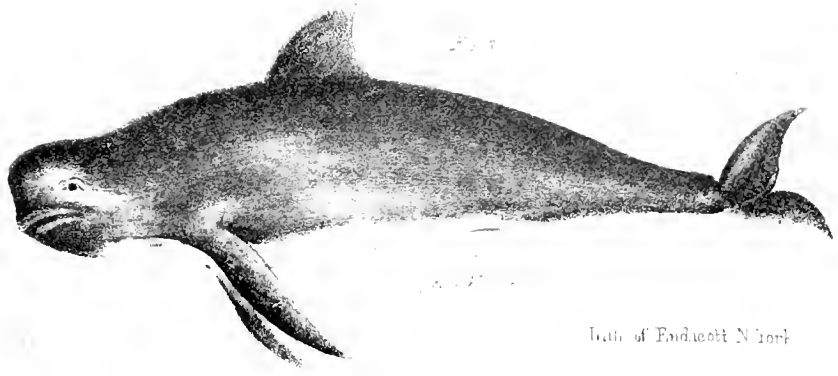


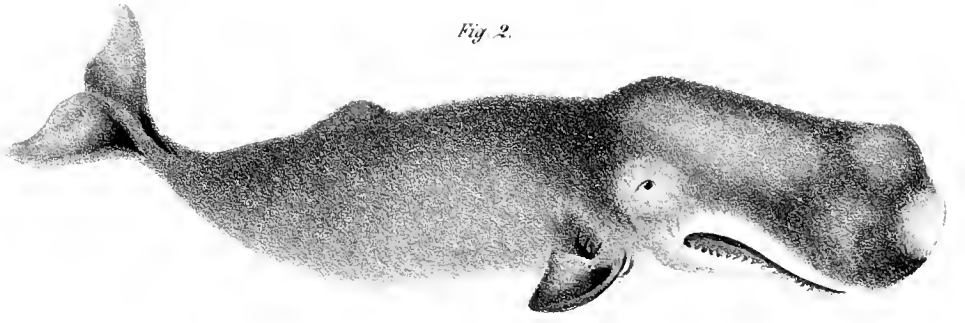


Lith. of Endicott N York

Fig 1

1/17 Nat size

Fig 2.



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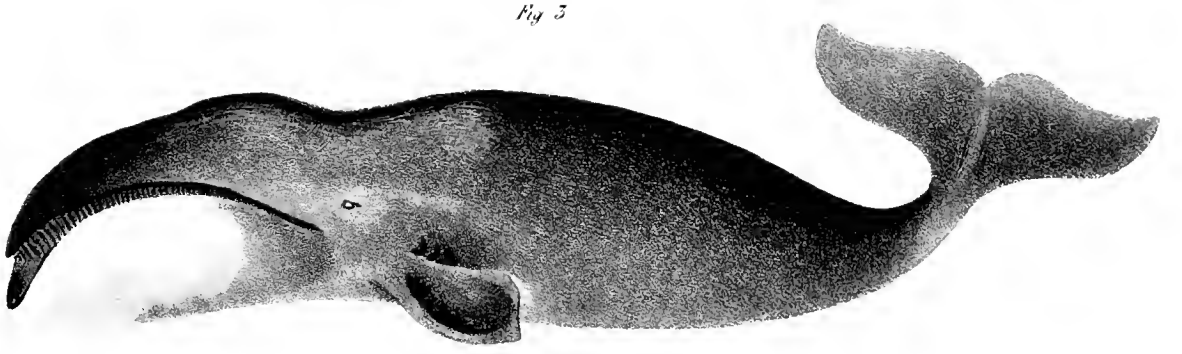

J W Hill

Lith of Endicott New York

Plate 52.

Fig 1 a

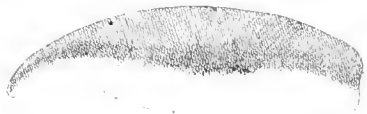

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Fig 1

½ Nat size

Fig 2

3.5 Nat size

Fig 4

Fig 3

½ Nat size

Lith of Evans & Co Nat Hist

Fig 1

Fig 2

Fig 3

Fig 4